ORDER NO. MKE0003004C1

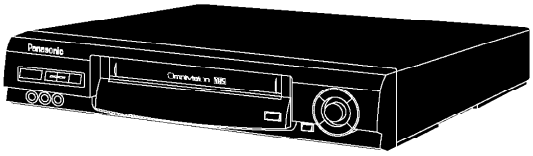
B3

Service Manual

Video Cassette Recorder

Omnivision VHS

PV-V4660-K



SPECIFICATIONS

ITEM	SPECIFICATION
Power	Source: 120 V AC±12 V AC, 60 Hz±3 Hz
	Consumption: Approx. 23 W (Power on), Approx. 3.3 W (Power off)
Video	Head: 4 rotary heads helical scanning system
	Input Level: VIDEO IN Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Output Level: VIDEO OUT Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced Signal-to-Noise Ratio: SP : more than 43 dB LP/SLP: more than 41 dB Horizontal Resolution: Color/Monochrome: more: SP : 230 lines LP/SLP : 220 lines
Audio	Head: Normal Mono : 1 stationary head Hi-Fi Stereo : 2 rotary heads
	Input Level: AUDIO IN Jack (Phono type) -10 dBv 50 kΩ unbalanced Output Level: AUDIO OUT Jack (Phono type) -8 dBv 1 kΩ unbalanced
	Frequency Response: Normal Mono: SP: 100 Hz-8 kHz LP: 100 Hz-6 kHz SLP: 100 Hz-5 kHz Hi-Fi Stereo: SP/LP/SLP: 20 Hz-20 kHz
	Signal-to-Noise Ratio: Normal Mono: SP: more than 42 dB LP/SLP: more than 40 dB Hi-Fi Stereo: SP/LP/SLP: more than 80 dB
	Wow and Flutter: Normal Mono: SP : Less than 0.2 % WRMS LP : Less than 0.3 % WRMS SLP: Less than 0.4 % WRMS Hi-Fi Stereo: Less than 0.015 % WRMS

ITEM	SPECIFICATION
RF Out	CH 3/CH 4 switchable 72 dBμ (open voltage) 75 Ω unbalanced
Tuner	Broadcast Channels: VHF 2–13, UHF 14–69 CATV Channels: Midband A through I (14–22) Superband J through W (23–36) Hyperband AA–EEE (37–64) Lowband A-5–A-1 (95–99) Special CABLE channel 5A (01) Ultraband 65–94, 100–125
Video Signal	EIA Standard (525 lines, 60 fields) NTSC Color Signal
Tape Speed	SP: 1-5/16 i.p.s (33.35 mm/s), LP: 21/32 i.p.s (16.67 mm/s), SLP: 7/16 i.p.s (11.12 mm/s) Record/Playback Time: 8 hr. with T-160 min. type tape used in SLP mode FF/REW Time: Less than 1-1/6 min. (120 min. type tape) *Note: FF/REW Time may exceed specification according to tape condition.
Tape Format	Tape width 12.7 mm (1/2 inch) high density tape
Operating Condition	5 °C-40 °C (41 °F-104 °F) (Temperature) 10 %-75 % (Humidity)
Dimension	430 mm x 98 mm x 250 mm (W x H x D) (16-15/16 inch x 3-7/8 inch x 9-3/4 inch (W x H x D))
Weight	3.4 kg (7.4 lbs.)

Weight and dimensions shown are approximate.
Designs and specifications are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

1. SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by⚠ in the Schematic Diagrams, Circuit BoardLayout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permissionof manufacturer.

2. **An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician fromaccidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.**
3. **When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.**
4. **After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.**
5. **After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.**

LEAKAGE CURRENT COLD CHECK

1. **Unplug the AC cord and connect a jumper between the two prongs on the plug.**
2. **Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallicpart has a return path to the chassis, the reading should be between 1 MΩ and 5.2 MΩ. When the exposed metal does not have a return path to the chassis, the reading must be infinity.**

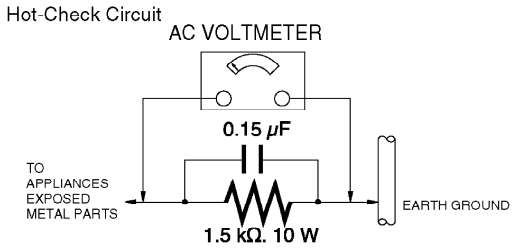
LEAKAGE CURRENT HOT CHECK
(See figure 1.)

1. **Plug the AC cord directly into the AC outlet. Do not use an**

isolation transformer for this check.

2. **Connect a 1.5 k Ω , 10 W resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground, as shown in figure 1.**
3. **Use an AC voltmeter, with 1 k Ω /V or more sensitivity, to measure the potential across the resistor.**
4. **Check each exposed metallic part, and measure the voltage at each point.**
5. **Reverse the AC plug in the AC outlet and repeat each of the above measurements.**
6. **The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks. Leakage current must not exceed 1/ 2 mA. In casea measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.**

Figure 1



2. PREVENTION OF ELECTRO-STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits, some field-effecttransistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. **Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain andwear a commercially available discharging ESD wrist strap, which should remove electrostatic charge for potential shock**

reasons prior to applying power to the unit under test.

2. **After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.**
3. **Use only a grounded-tip soldering iron to solder or unsolder ES devices.**
4. **Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.**
5. **Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.**
6. **Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together byconductive foam, aluminum foil or comparable conductive material).**
7. **Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.**
   CAUTION:Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. **Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor cangenerate static electricity (ESD) sufficient to damage an ES device).**

"NOTE to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connectedto the grounding system of the building, as close to the point of cable entry as practical."

3. OPERATION GUIDE

4. SERVICE NOTES (PLEASE READ)

4.1. SERVICE NOTES

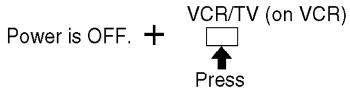
4.1.1. SIMPLIFIED FAULT FINDING DATA

Simplified Self-Diagnostic System facilitates finding the cause of the fault. A 4 digit fault code will be displayed in F.I.P.

The Simplified Fault finding data is stored in the Memory IC (IC6005). This data is cleared after it is displayed, and then the POWER button is pressed back on.

1. With power turned off, press VCR/TV button on VCR (for over 3 seconds if VCR is not in shut off condition).

Fig. 1-1



2. Fault code (4 digit number) will be displayed in F.I.P. as shown.

Fig. 1-2

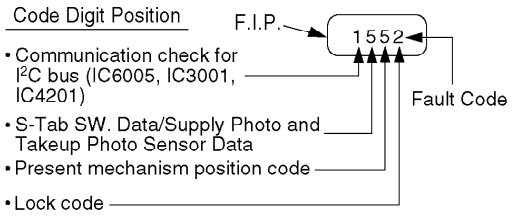

Code Digit Position
F.I.P.
1552
Fault Code
• Communication check for I²C bus (IC6005, IC3001, IC4201)
• S-Tab SW. Data/Supply Photo and Takeup Photo Sensor Data
• Present mechanism position code
• Lock code

Fig. 1-3

Explanation of Codes	Code No.			
Communication check for I²C bus (IC6005, IC3001, IC4201) (Refer to Fig. 1-4.)	1 ~ 8			
S-Tab SW. Data/Supply Photo and Takeup Photo Sensor Data (Refer to Fig. 1-5.)		1 ~ 8		
Present Mechanism Position Code Mechanism Position is indicated. (Refer to Fig. 1-6.)			1 2 3 4 5 6 7 8 9 A B C D	
Lock Code (See Note) • VCR is not in shut-off condition. • Reel lock. • Cylinder lock. • Exceeds loading/unloading time. (Mechanism Lock) • Exceeds Cassette loading/unloading time. (Cassette Lock) Tape Unloading (direction) Tape Loading (direction)			 1 2	0 1 2 3 4 4

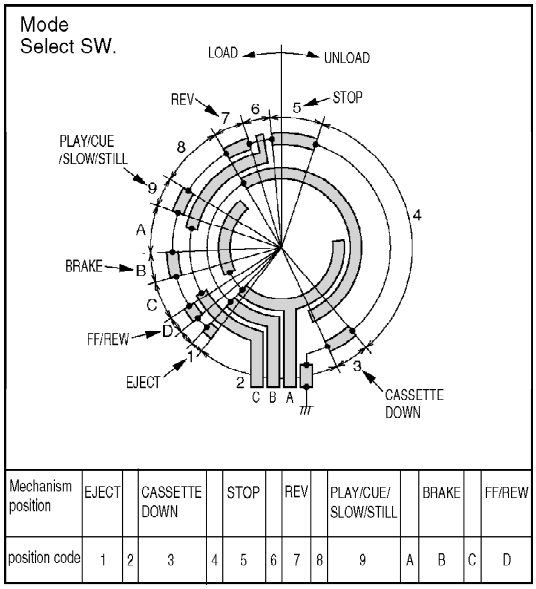
Fig. 1-4

Communication check for I²C bus (IC6001◄►IC6005)	Communication check for I²C bus (IC6001◄►IC3001)	Communication check for I²C bus (IC6001◄►IC4201)	Code No.
OK	OK	OK	1
		NG	2
	NG	OK	3
		NG	4
NG	OK	OK	5
		NG	6
	NG	OK	7
		NG	8

Fig. 1-5

S-Tab SW. condition	Supply Photo Sensor condition	Takeup Photo Sensor condition	Code No.
ON	OFF	OFF	1
	ON	OFF	2
	OFF	ON	3
	ON	ON	4
OFF	OFF	OFF	5
	ON	OFF	6
	OFF	ON	7
	ON	ON	8

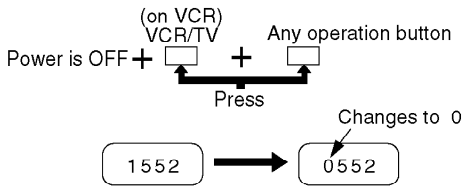
Fig. 1-6



Mechanism position	EJECT		CASSETTE DOWN		STOP		REV		PLAY/CUE/ SLOW/STILL		BRAKE		FF/REW
position code	1	2	3	4	5	6	7	8	9	A	B	C	D

3. While pressing VCR/TV button on VCR with power turned off, press any operation button on either VCR, or remote to detect that a key has been pressed.
The 1st digit changes to "0" only when key is detected.

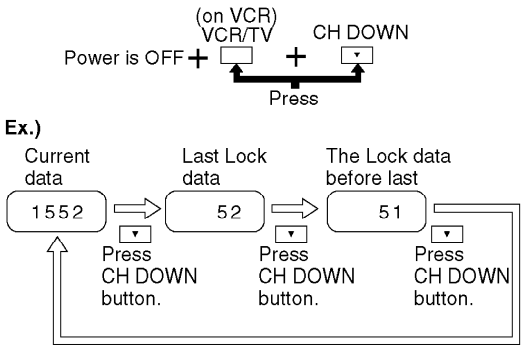
Fig. 1-7



4. When 1 to 4 listed in Lock code occurs, Lock data will be stored

into EEPROM IC (Current data, Last Lock data, and the Last Lock data before last). Lock data displayed in F.I.P. will be changed by pressingCH DOWN button.

Fig. 1-8



Note:

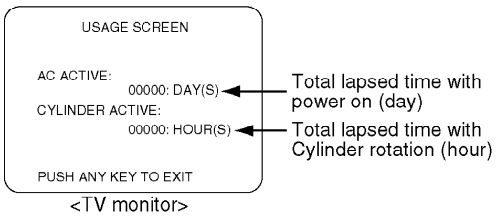
1. **Lock data will be kept after AC Cord is unplugged.**
2. **When 1 to 4 listed in Lock code occurs, the VCR goes into VCR shut-off condition. VCR stops and all VCR function buttons except for power become non-operational.**

4.1.2. USAGE SCREEN MODE

This function displays the Total lapsed time with power on (day) and the Total lapsed time with Cylinder rotation (hour) on the TV monitor.

1. **With power turned on without a cassette, press VCR/TV button on VCR and 7 key on remote together.**
   The USAGE SCREEN will be displayed on the TV Monitor.

Fig. 1-9



<TV monitor>

Note:

After replacing the Cylinder Unit, press COUNTER RESET button on remote in this mode. Only Total lapsed time with Cylinder rotation (hour) will be cleared to 0.

2. **To release from Usage Screen Mode, press any operation button on VCR in this mode. VCR will return to normal operation mode.**

4.1.3. EEPROM IC (IC6005), MAIN C.B.A. REPLACEMENT NOTE

After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.

4.1.4. SERVICE POSITION

4.1.4.1. Service Position

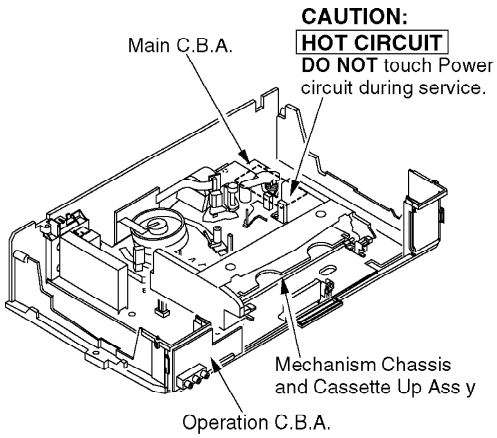
Service Position	Purpose
Service Position (1)	Mechanism check Mechanical adjustment Electrical adjustment
Service Position (2)	Main C.B.A. check

CAUTION:

HOT CIRCUIT (Primary circuit) exists on the Main C.B.A.
Use extreme care to prevent accidental shock when servicing.

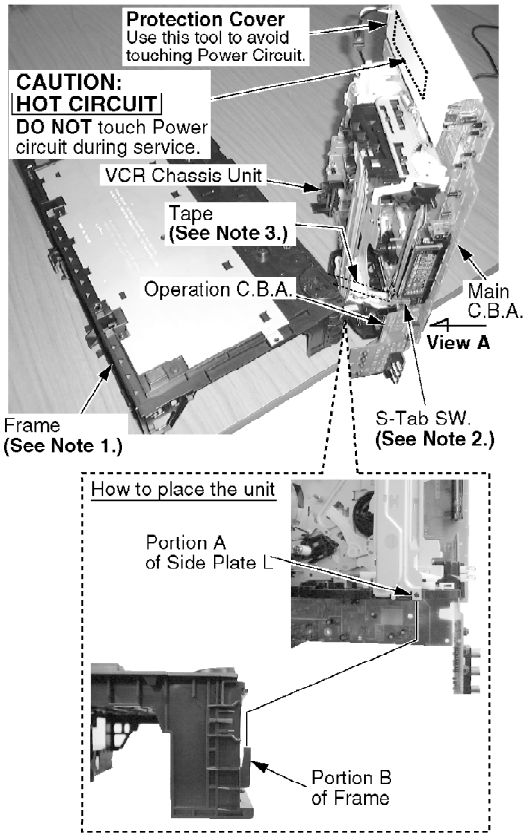
4.1.4.1.1. Service Position (1)

Fig. 2-1



4.1.4.1.2. Service Position (2)

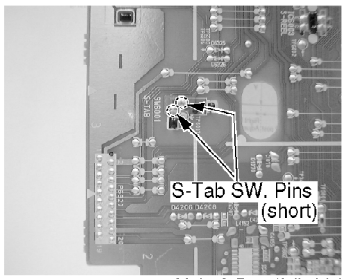
Fig. 2-2



Note:

1. **Alternative method in Service Position (2)**
   2 piled VHS Cassette Tapes can be substituted for the Frame as shown in Fig. 2-2.
2. **When recording in Service Position (2), short the S-Tab SW. Pins on foil side of Main C.B.A. to turn this SW. on.**

Fig. 2-3



Main C.B.A. (foil side)
View A

Alternative method:
Cover the S-Tab SW. with masking tape.

3. **Place the tape between the Cassette Up Ass'y and Main C.B.A. to get a stability.**
4. **When disassembling/assembling, refer to "CABINET SECTION" in**

DISASSEMBLY/ASSEMBLY PROCEDURES.

To avoid touching Power Circuit,
following Tool (**Protection Cover**) is recommended.

How to make the Protection Cover:

1. Cut a Cassette Tape Case as shown.

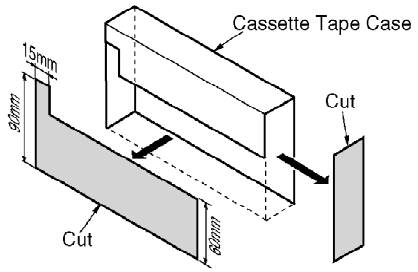


Fig. 2-4

2. Cover the Power Circuit portion on Main C.B.A. with it.

Note:
The Protection Cover is not supplied.

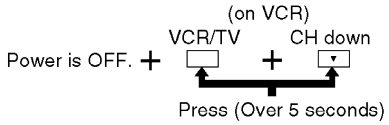
4.1.5. HOT CIRCUIT

Primary circuit exists on the Main C.B.A.
This circuit is identified as " HOT " on the C.B.A. and in the Service Manual. Use extreme care to prevent accidental shock when servicing.

4.1.6. SERVICE MODE

In order to inhibit detection of the Supply& Takeup Photo Transistors, Reel Sensor, and Cylinder Lock, press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.

Fig. 3-1

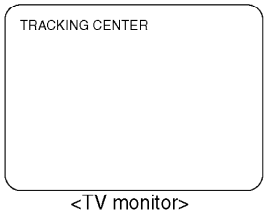


The power comes on and the unit goes into service mode.
In this mode, Mechanism movement can be confirmed. When removing Cassette Up Ass'y, it can be confirmed without a cassette.
To release from this mode, press POWER button off or disconnect AC Plug.

4.1.7. TRACKING CENTER MODE (TRACKING FIX AT CENTER)

Insert the Cassette tape. Set the unit into Service Mode. Play back the Cassette tape. Press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor. In this mode, the tracking is fixed at center. (Autotracking and manual tracking functions are not operational.)

Fig. 3-2



<TV monitor>

To release from this mode, press PLAY or STOP button.

4.1.8. CAUTION FOR INSTALLATION OF FRONT PANEL ASS'Y

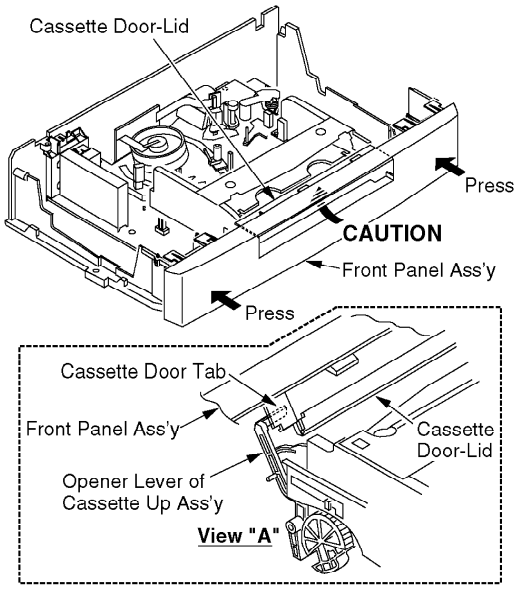
CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

Install the Front Panel Ass'y as follows:

1. **Swing the Cassette Door -Lid all the way open until the Cassette Door tab clears the Opener Lever.**
2. **Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.**

Fig. 4



4.1.9. METHOD FOR LOADING/UNLOADING OF MECHANISM

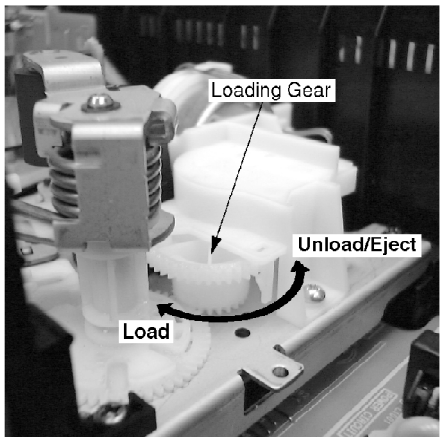
(Manual Method)

Turn the Loading Gear clockwise (for loading) or counterclockwise (for unloading) using needlenose pliers etc.

Note:

Do not use this method if Mechanism is jammed or locked.

Fig. 5-1

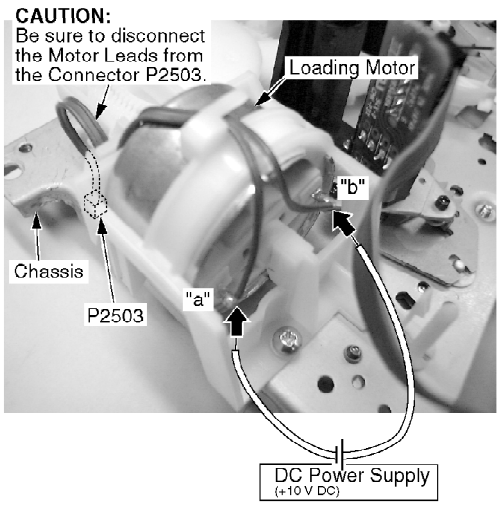


(Electrical Method)
Apply+10.0 V DC Power Supply to the Loading Motor terminals.
Loading
DC+ to Portion "a," DC - to Portion "b"
Unloading
DC - to Portion "a," DC+ to Portion "b"

CAUTION:

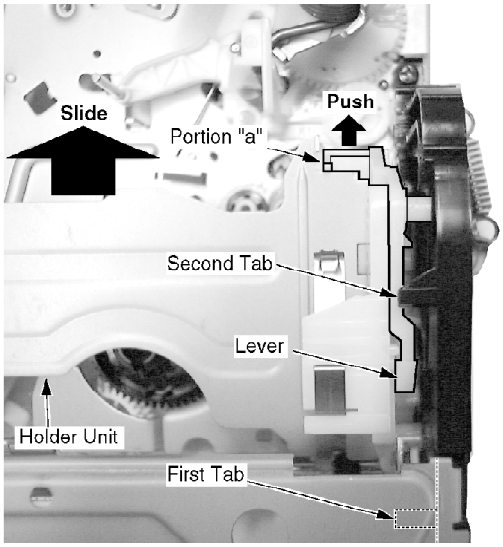
Before applying DC Power Supply, be sure to disconnect the Motor Leads from the Connector P2503.
Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.

Fig. 5-2



When loading without a cassette, push Portion "a" on the Holder Unit of Cassette Up Ass'y so that the Lever clear the First Tab and Second Tab.

Fig. 5-3



4.1.10. HOW TO REMOVE A JAMMED TAPE

CAUTION:

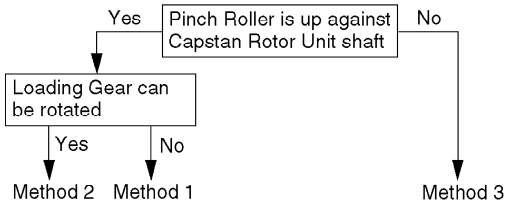
Wiper Arm Unit may be damaged or its spring may be out of place when the jammed tape is removed by force.

Remove a jammed tape as follows:

4.1.10.1. Manual Method

When a tape jam is encountered, check the tape loading condition and use the following procedure to remove a tape jam.

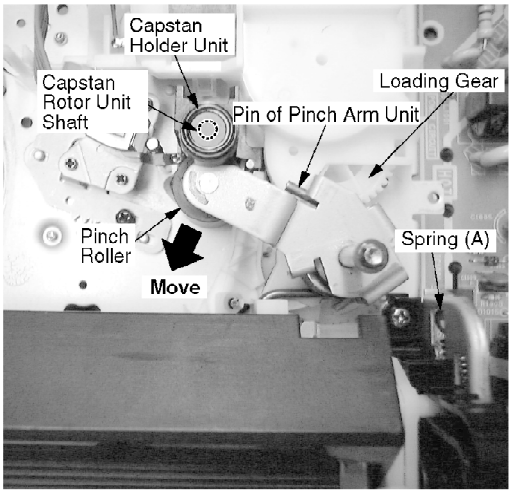
Fig. 6-1



4.1.10.1.1. Method -1:

1. Move the Pinch Roller Unit out by unhooking the Pin of Pinch Arm Unit so that the Pinch Roller is separated from the Capstan Rotor Unit shaft.

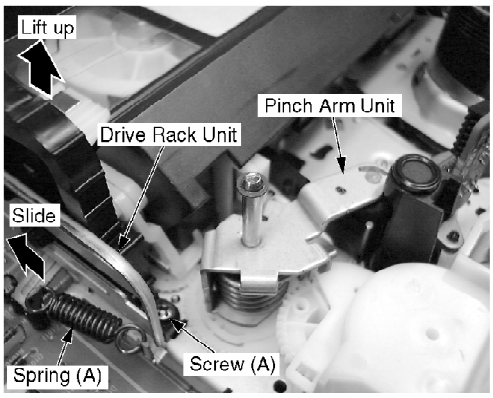
Fig. 6-2



Top View

2. Remove the tape from the tape path.
3. Rewind the tape into the cassette by rotating the Center Clutch Unit counterclockwise.
4. Unhook Spring (A) of the Drive Rack Arm.
5. Remove Screw (A).
6. Lift the Cassette Up Ass'y. While pulling the Cassette Up Ass'y out far enough so that it clears the Drive Rack Arm, slide the Drive Rack Unit as indicated by the arrow to remove the cassettetape from the Cassette Up Ass'y.
7. Check the cause of mechanical trouble and repair.

Fig. 6-3



4.1.10.1.2. Method -2:

1. Rotate Loading Motor counterclockwise with needlenose pliers, etc. so that the Pinch Roller is separated from the shaft of the Capstan Rotor Unit.

2. Perform Step 2 through Step 7 of Method -1.

4.1.10.1.3. Method -3:

1. Perform Step 2 through Step 7 of Method -1.

Note:

After repairing mechanical trouble, make sure that all gear alignments are correct, especially the Wiper Arm Unit and Drive Rack Unit of Cassette Up Ass'y. (Refer to "EJECTPosition Confirmation" in DISASSEMBLY/ASSEMBLY PROCEDURES.)

4.1.10.2. Electrical Method

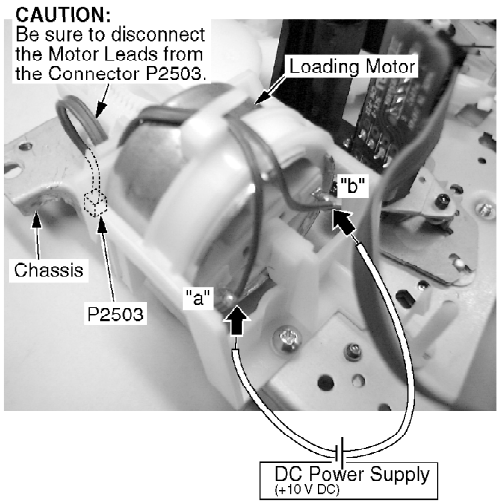
Electrical method can only be performed when the mechanism is moved by rotating the Loading Gear.

CAUTION:

1. Before applying DC Power Supply, be sure to disconnect the Motor Leads from the Connector P2503.
   Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.
2. If loading does not start in approx. 2 seconds after DC Power Supply is applied, DO NOT continue to apply DC Power Supply. Instead, perform "Manual Method."

1. Be sure to disconnect the Motor Leads from the Connector P2503.
2. Apply+10.0 V DC Power Supply to the Loading Motor terminals.
3. When the Loading Posts reach the fully unloaded position, remove the Power Supply.

Fig. 7



4. Rewind the tape into the cassette by turning the Center Clutch

Unit counterclockwise.

5. Eject the cassette by applying+10.0 V DC Power Supply again.

4.1.11. BLACK SCREWS ON THE CHASSIS

Black Screws are used on the Mechanism Chassis to identify screws that require adjustment.

4.1.12. HOW TO RESET ALL VCR MEMORY FUNCTIONS

To reset (clear) the select language, channel auto set and set clock functions to their initial power on condition (power on, nocassette inserted), hold down the PLAY and CH UP buttons on the unit togetherfor more than 5 seconds.
Power will shut off.

4.1.13. HOW TO CONFIRM AUTO CLOCK SET FEATURE

1. Connect an RF cable from the output of one unit to the input of the test unit.
2. Select corresponding RF channels.
3. Playback a recording of P.B.S. channel including clock set data and confirm this feature.

4.1.14. VARIABLE VOLTAGE ISOLATION TRANSFORMER

An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resultingin personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing. Also, when troubleshooting the above type of Power Supply Circuit, a variable isolation transformer is required in order to increase the input voltage slowly.

4.1.15. SPECIAL NOTE

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

4.1.16. REPLACEMENT PROCEDURE FOR LEADLESS (CHIP) COMPONENTS

The following procedures are recommended for the replacement of the leadless components used in this unit.

1. Preparation for replacement
   A. Soldering Iron
      Use a pencil-type soldering iron that uses less than 30 watts.
   B. Solder
      Eutectic Solder (Tin 63%, Lead 37%) is recommended.
   C. Soldering time
      Do not apply heat for more than 4 seconds.
   D. Preheating
      Leadless capacitor must be preheated before installation. -

(266°F ~ 302°F)
(130°C ~150°C) for about 2 minutes.

Note:

A. Leadless components must not be reused after removal.

B. Excessive mechanical stress and rubbing of the component electrode must be avoided.

2. Removing the leadless component

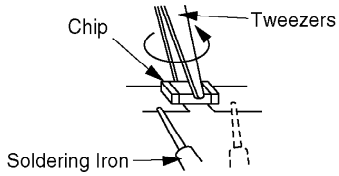
Grasp the leadless component body with tweezers and alternately apply heat to both electrodes. When the solder on both electrodes is melted, remove the leadless component with a twisting motion.

Note:

A. Do not attempt to lift the component off the board until the component is completely disconnected from the board by a twisting action.

B. Be careful not to break the copper foil on the printed circuit board.

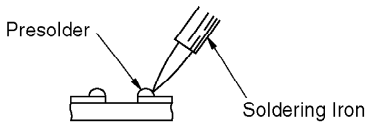
Fig. 8-1



3. Installing the leadless component

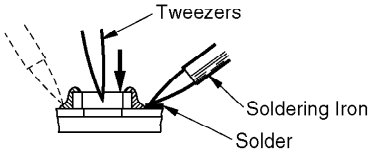
A. Presolder the contact points on the circuit board.

Fig. 8-2



B. Press the part downward with tweezers and solder both electrodes as shown below.

Fig. 8-3

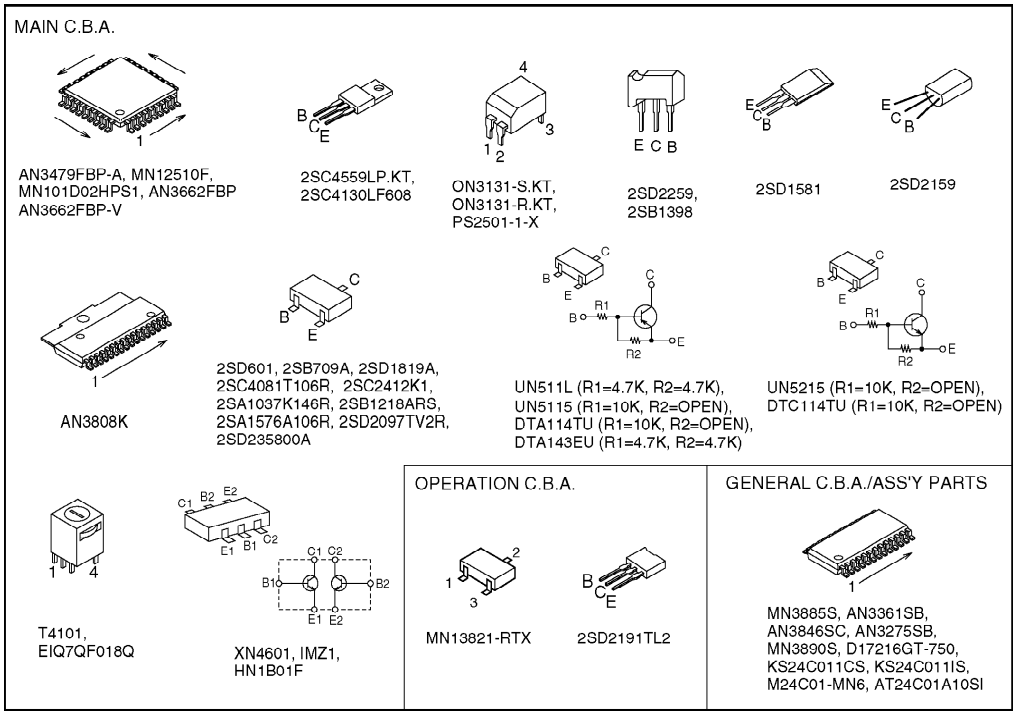


Note:

Do not glue the replacement leadless component to the circuit

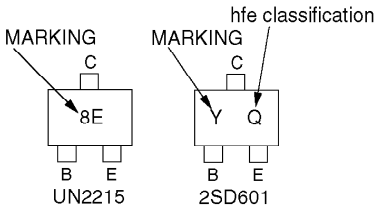
board.

4.2. IC, TRANSISTOR AND CHIP PART INFORMATION

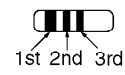


4.2.1. HOW TO READ THE IDENTIFICATION MARK OF CHIP COMPONENTS.

MARKING	PART NO.	MARKING	PART NO.
B	2SB709A	Z	2SD1819A
B	2SC4081T106R	1R	2SB970
B	2SB1218ARS	5C	XN4601
F	2SA1037K146R	6E	UN5115
F	2SA1576A106R	6Q	UN511L
Y	2SD601	8E	UN5215



4.2.2. HOW TO READ THE VALUES OF THE CYLINDRICAL TYPE CHIP COMPONENTS.



The widest color band must be read first for value.

1. RESISTOR

There are two types (ERD10LLJ... and ERD10TLJ...) of chip parts.

A. ERD10LLJ: Refer to above type.

B. ERD10TLJ: The narrow color band must be read first for value.

If this part is included in the parts list, be sure that the color band is read properly when servicing.

2. CAPACITOR

Because of the width of the color bands, the reading direction cannot be specified. However, the color band can be read on either side. Be sure to confirm the value using the schematic diagram.

CAUTION :

Once chip parts are removed, they must not be reused. Always use a new part when installing a chip part.

5. DISASSEMBLY/ASSEMBLY PROCEDURES

5.1. CABINET SECTION

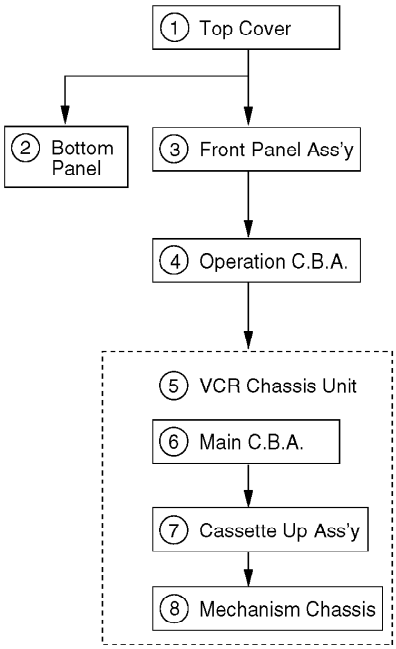
5.1.1. Disassembly Flowchart

Perform all disassembly procedures in the order described in the "Disassembly Flowchart" shown below. When reassembling, use the reverse procedure.

CAUTION:

Disconnect AC plug before disassembly.

Fig. D1



5.1.2. Disassembly Method

STEP /LOC. No.	PART	Fig. No.	REMOVE	Note
①	Top Cover	D2	2(S-1), 2(S-2)	1
②	Bottom Panel	D2	2(S-3), (S-4), 2(L-1)	---
③	Front Panel Ass'y	D2	2(L-2), 2(L-3), 3(L-4)	2
④	Operation C.B.A.	D2	P6302, 2(L-5)	---
⑤	VCR Chassis Unit	D2	(S-5), 2(S-6), Chassis Angle, 2(S-7), (L-6)	3
⑥	Main C.B.A.	D2	P6201, P6202, P3551, P4451, P4001	4
⑦	Cassette Up Ass'y	D2	(S-8), 2(S-9), (L-7), (P-1)	5
⑧	Mechanism Chassis	D2	----------	---
	A	B	C	D	E

How to read chart shown above:

A:Order of Procedure steps.

When reassembling, perform steps(s) in reverse order.

These numbers are also used as the identification (location) No. of parts in Figures.

B: Part to be removed or installed.

C: Fig. No. showing Procedure or Part Location.

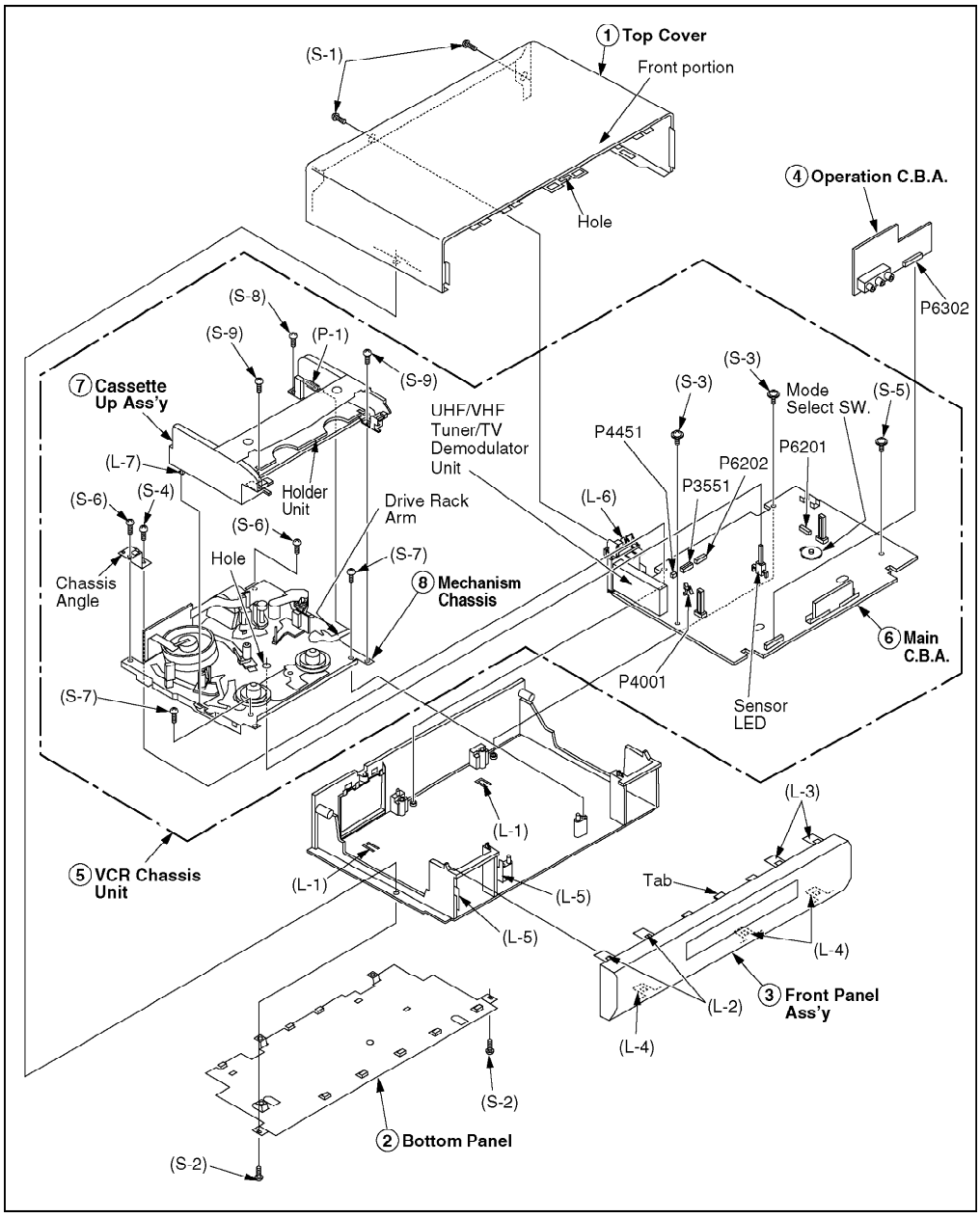
D: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.

2(S-1)= 2 Screws (S-1), 2(L-1)= 2 Locking Tabs (L-1),

(P-1)= Spring (P-1)

E: Refer to "Notes in chart."

Fig. D2



5.1.2.1. Notes in chart

1. Installation of Top Cover

Install the Top Cover front portion at a downward angle so that the tab on the Front Panel Ass'y fits into the hole in the Top Cover. Then, lower the rear portion into place and tighten 2 Screws (S-1) and 2 Screws (S-2).

2. Installation of Front Panel Ass'y

CAUTION:

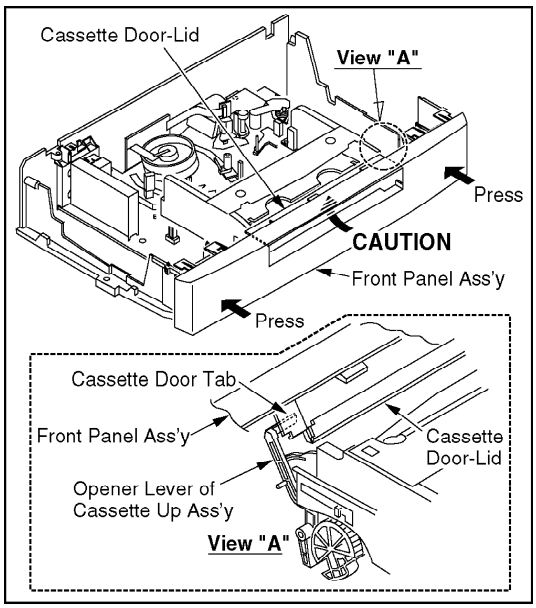
Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener

Lever of Cassette Up Ass'y set incorrectly.

A. When installing the Front Panel Ass'y, swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.

B. Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.

Fig. D3



3. Installation of VCR Chassis Unit

When installing 2 Screws (S-7), slide the Holder Unit of the Cassette Up Ass'y (Refer to "METHOD FOR LOADING/ UNLOADING OF MECHANISM" in SERVICE NOTES) totighten screws. Then, slide it back to the EJECTPosition.

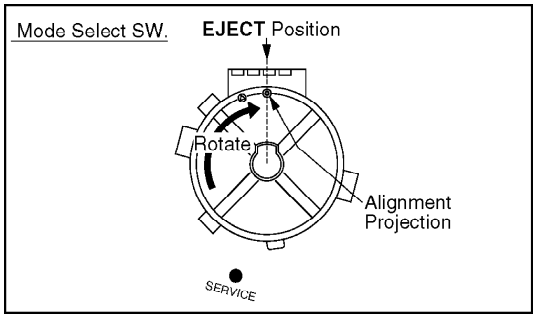
Make sure that Mechanism and Cassette Up Ass'y are in the EJECTPosition. (Refer to "EJECT Position Confirmation" in DISASSEMBLY/ASSEMBLYPROCEDURES.)

4. Installation of Mechanism Chassis and Cassette Up Ass'y onto Main C.B.A.

A. Make sure the Mode Select SW. on the Main C.B.A. is in EJECT position. If not, rotate the Mode Select SW. until the alignment projection is in the EJECTPosition.

B. Make sure the Mechanism and Cassette Up Ass'y are in the EJECTPosition. (Refer to "EJECT Position Confirmation"in DISASSEMBLY/ASSEMBLY PROCEDURES.)

Fig. D4



C. Install the Mechanism Chassis and Cassette Up Ass'y straight onto the Main C.B.A. so that the Sensor LED clears the hole in the Mechanism Chassis and that 5 Connectors (P6201, P6202, P3551, P4001,and P4451) are aligned and seated securely.

5. Installation of Cassette Up Ass'y

A. Confirm that the Locking Tab (L-7) under the Cassette Up Ass'y is in Hole on the Mechanism Chassis when installing the Cassette Up Ass'y. Then, slide the Cassette UpAss'y towards the back.

B. When installing 2 Screws (S-9), slide the Holder Unit (Refer to " METHOD FOR LOADING/UNLOADING OF MECHANISM" in SERVICE NOTES) to tighten screws.Then, slide it back to the EJECTPosition.

C. Hook Spring (P-1) to the Drive Rack Arm on the Mechanism Chassis.

5.2. MECHANISM SECTION

5.2.1. Disassembly/Reassembly Method

This procedure starts with the condition that the cabinet parts and Main C.B.A. have been removed.
When reassembling, perform the step(s) in the reverse order.
Perform all disassembly/reassembly and alignments procedures in EJECT Position.

Step/Loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	----------	Grounding Plate Unit	J2-1	(S-1)	Adjustment
②	----------	Full Erase Head	J2-1	(L-1)	
③	1	Cylinder Unit	J2-1	P4092, Unsolder, 2(S-2), 3(S-3), Head Amp C.B.A.	TAPE INTERCHANGEABILITY Adjustment
④	----------	Capstan Belt	J3-1	-	
⑤	----------	Support Angle	J3-1	(S-4), 2(S-5)	
⑥	5	Intermediate Gear B	J3-1	(L-2)	Gear Alignment
⑦	4,5,6	Main Cam Gear	J3-1	Main Cam Push Nut	Gear Alignment
⑧	4	Center Clutch Unit	J4-1	(W-1)	
⑨	4,8	Changing Gear Spring	J4-1	-	
⑩	4,8,9	Changing Gear	J4-1	-	
⑪	4,8,9,10	Idler Arm Unit	J4-1	-	
⑫	----------	Reel Gear	J5-1	2(L-3)	
⑬	4,5,6,7,8,9,10	Main Rod	J5-1	(W-2), (L-4)	Gear Alignment
⑭	----------	Stopper Angle	J6-1	(S-6)	
⑮	4,5,14	Capstan Rotor Unit	J6-1	-	
⑯	4,5,14,15	Oil Seal	J6-1	-	
⑰	4,5,14,15	Capstan Stator C.B.A.	J6-1	P2503, 2(S-7)	
⑱	----------	MR Head	J6-1	(S-8), Unsolder	MR HEAD GAP Adjustment
⑲	4,8,9,10,13	T Loading Arm Unit	J7-1	-	Gear Alignment
⑳	4,5,6,7,8,9,10,13,19	S Loading Arm Unit	J7-1	-	Gear Alignment
㉑	----------	T Brake Unit	J8-1	-	
㉒	----------	Tension Control Arm Unit	J8-1	3(L-5)	
㉓	21	T Reel Table	J8-1	-	
㉔	22	S Reel Table	J8-1	-	
㉕	22	Tension Arm Unit	J8-1	2(L-6), (P-1), (P-2)	
㉖	22,25	Loading Post Base-T Unit	J9	-	P2 AND P3 POST HEIGHT, TAPE INTERCHANGEABILITY Adjustment
㉗	22,25	Loading Post Base-S Unit	J9	-	
㉘	----------	Opener Piece	J10-1	2(L-7)	
㉙	4,5,6,7	Drive Rack Arm	J10-1	-	
㉚	28	Pinch Arm Unit	J10-1	(C-1)	
㉛	28,30	P5 Arm Unit	J10-1	-	
㉜	5,6,28	Intermediate Gear A	J10-1	-	Gear Alignment
㉝	----------	Motor Block Unit	J11-1	2(S-9)	
㉞	----------	Audio Control Head Unit	J11	(S-10)	TAPE INTERCHANGEABILITY Adjustment
㉟	5,6,28,30,32,33	Lift Gear	J11	-	
㊱	4,5,14,15,33	Capstan Holder Unit	J11	3(S-11)	
㊲	22,25	Tension Arm Boss	J11	(L-8)	
㊳	4	SS Brake Arm Unit	J5-1	(L-9), (P-3)	
㊴	4,5,14,15,17	Sub Rotor Unit	J6-1	-	
㊵	----------	Cleaner Arm Unit	J11	(L-10)	
㊶	----------	Regulator Angle	J8-1	(S-12)	

A B C D E F

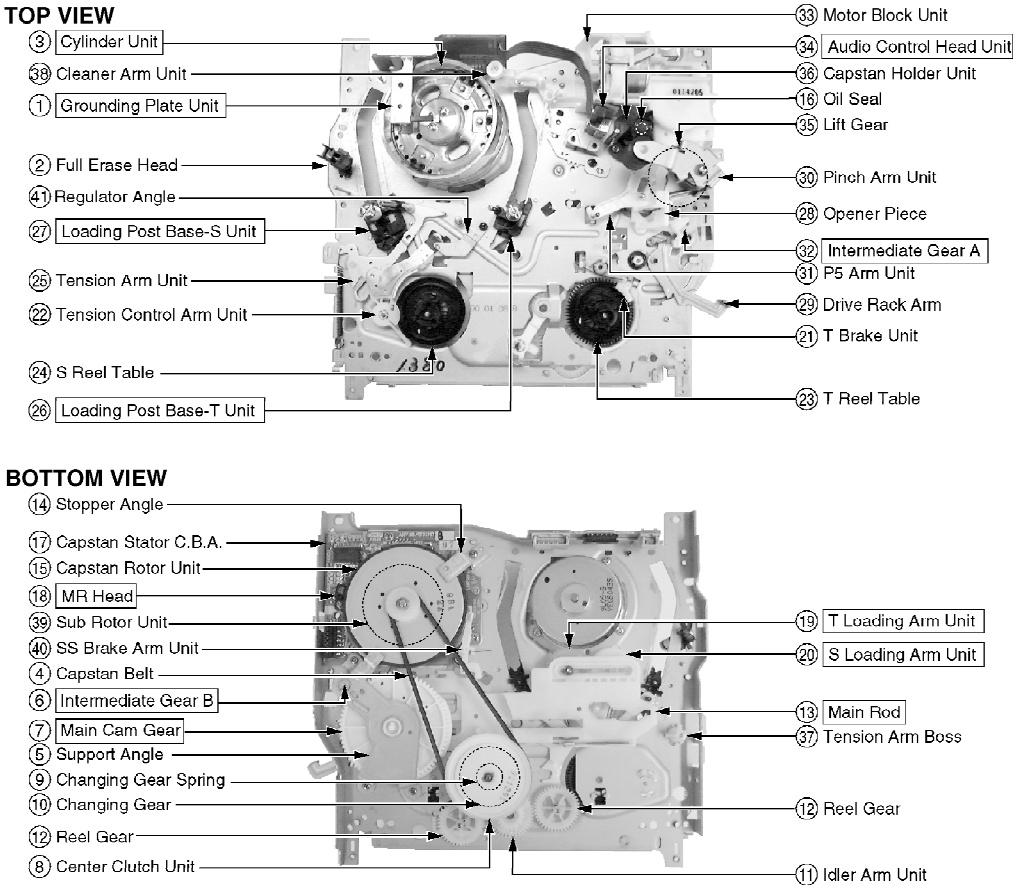
How to read chart shown above:
A: Order of Procedure steps.
When reassembling, perform steps(s) in reverse order.
These numbers are also used as the identification (location) No. of parts in Figures.
B: Steps to be completed prior to the current step.
C: Part to be removed or installed.
D: Fig. No. showing Procedure or Part Location.
E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.
(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1),
(W-1) = Washer (W-1), (P-1) = Spring (P-1),
(C-1) = Cut Washer (C-1)
F: Alignment/Adjustment which is required when installing or replacing each Parts.

CAUTION:
Removed Cut Washer is not reusable.
If removed, install a new one.

5.2.2. Inner Parts Location

Note: BOX indicates alignment (Gear Alignment or Mechanical Adjustment) required when a part is replaced.

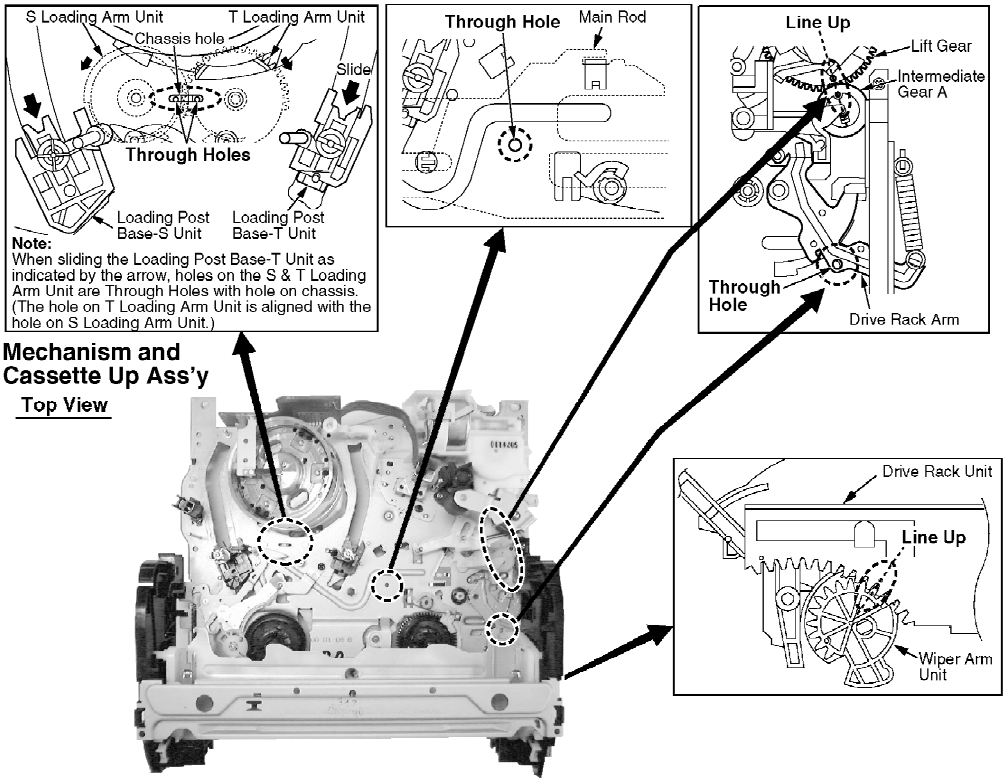
Fig. J1-1



5.2.3. EJECT Position Confirmation

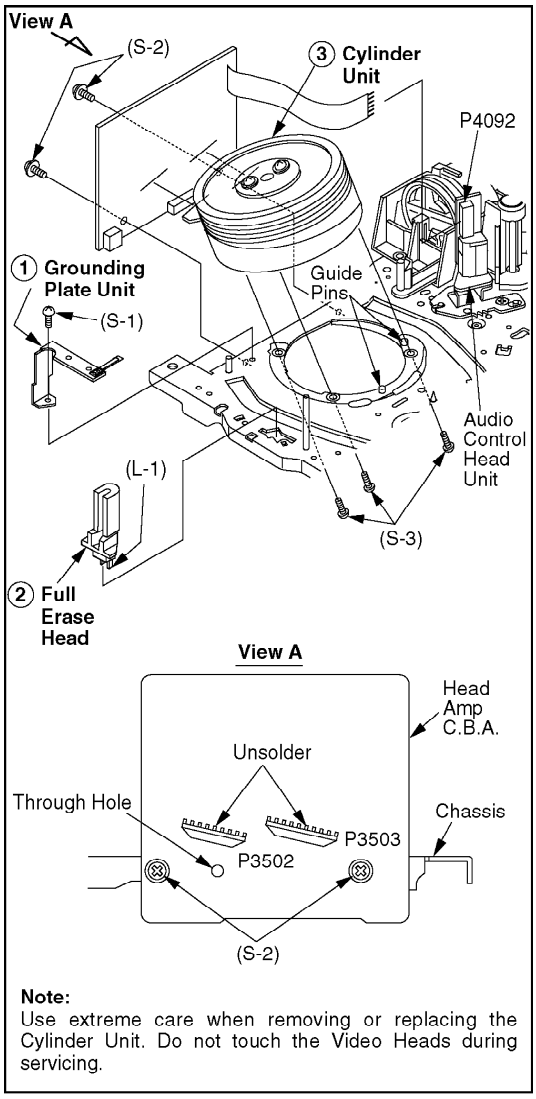
Fig. J1-2

Check the following alignment points to confirm that the Mechanism and Cassette Up Ass'y are in the **EJECT** Position from the top side.


S Loading Arm Unit
T Loading Arm Unit
Chassis hole
Slide
Through Holes
Loading Post Base-S Unit
Loading Post Base-T Unit
Note:
When sliding the Loading Post Base-T Unit as indicated by the arrow, holes on the S & T Loading Arm Unit are Through Holes with hole on chassis. (The hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.)
Through Hole
Main Rod
Line Up
Lift Gear
Intermediate Gear A
Through Hole
Drive Rack Arm
Mechanism and Cassette Up Ass'y
Top View
Drive Rack Unit
Line Up
Wiper Arm Unit

5.2.4. Grounding Plate Unit, Full Erase Head, and Cylinder Unit

Fig. J2-1



Note:
Use extreme care when removing or replacing the Cylinder Unit. Do not touch the Video Heads during servicing.

5.2.4.1. Reassembly Notes

1. Adjustment of Grounding Plate Unit

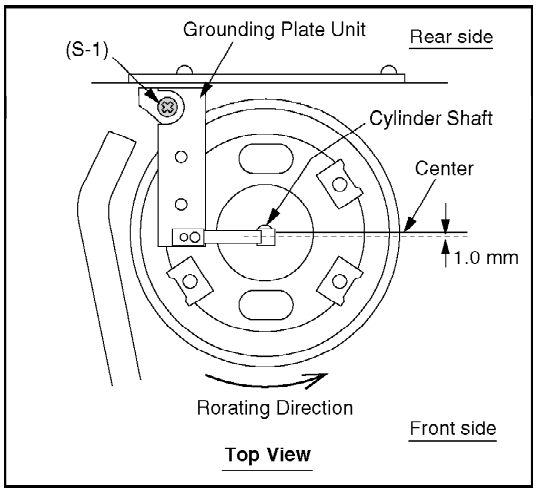
A. After installing, make sure that the Grounding Plate Unit, on the top side of mechanism chassis, is positioned on the front side of the Cylinder shaft so that the center line of the plateis just less than 1.0 mm measured from the center of the Cylinder shaft.

If required, adjust the plate position by loosening Screw (S-1).

Never install the Grounding Plate Unit on the rear side of the Cylinder shaft.

Incorrect positioning will cause cylinder buzz.

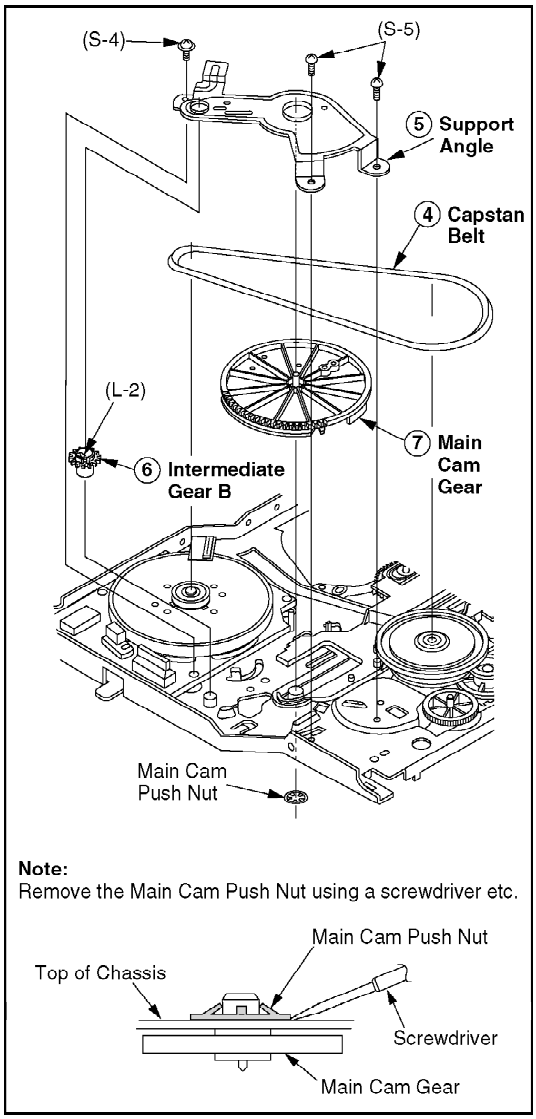
Fig. J2-2



2. After replacing the Cylinder Unit, clear the Total lapsed time with Cylinder rotation (hour) to 0. Refer to "USAGE SCREEN MODE" in SERVICE NOTES.

5.2.5. Capstan Belt, Support Angle, Intermediate Gear B, and Main Cam Gear

Fig. J3-1



5.2.5.1. Reassembly Notes

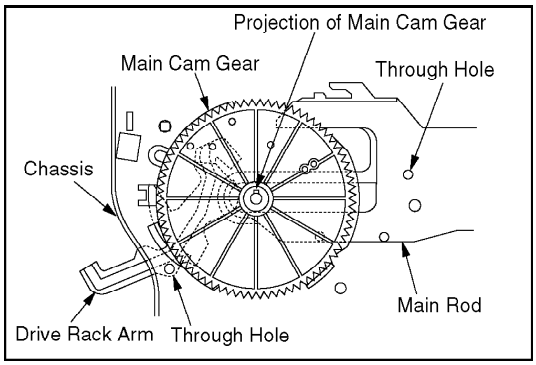
1. Alignment of Main Cam Gear, Drive Rack Arm, and Main Rod

A. Confirm that the hole on Main Rod is a Through Hole with a hole on chassis.

B. Confirm that the hole on Drive Rack Arm is a Through Hole with a hole on chassis.

C. Install the Main Cam Gear so that the projection of Main Cam Gear is in the upward position as shown.

Fig. J3-2

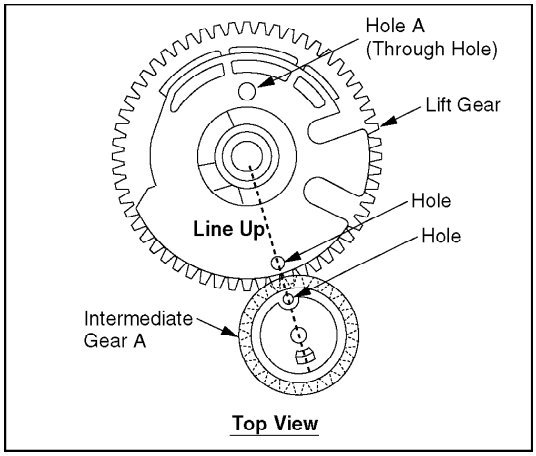


2. Confirmation/Alignment of Intermediate Gear B, Main Cam Gear, and Intermediate Gear A

A. Confirm that the Hole A on Lift Gear is a Through Hole with a hole on chassis.

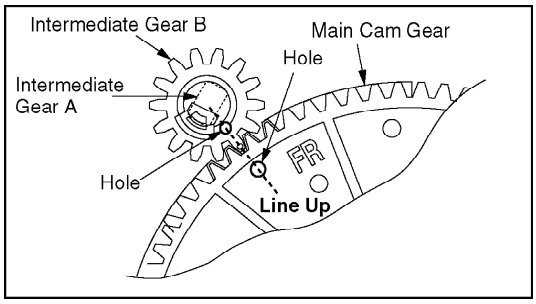
B. Confirm that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

Fig. J3-3



C. Install the Intermediate Gear B so that the hole on the Intermediate Gear B is aligned with the hole on the Main Cam Gear.

Fig. J3-4

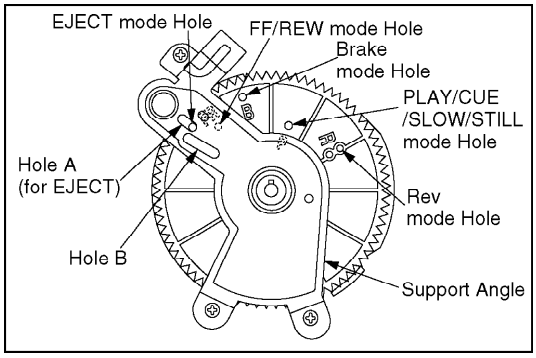


3. Holes on Main Cam Gear

A. The EJECT mode Hole on Main Cam Gear should be a Through

Hole with Hole A on Support Angle in EJECT mode. The each mode Hole on Main Cam Gear should be a Through Hole with Hole B on SupportAngle in each mode.

Fig. J3-5



4. Main Cam Gear Kit

A. Main Cam Gear is supplied as a Main Cam Gear Kit only (Kit No. VVGS0009).

Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut.

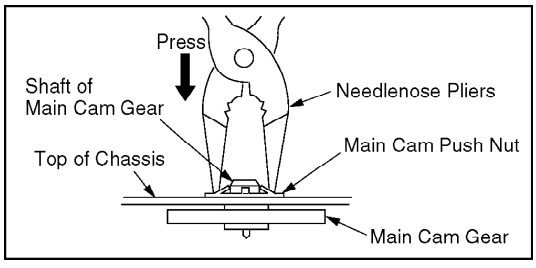
However, Main Cam Push Nut is available separately as a replacement part.

5. Installation of Main Cam Gear and Main Cam Push Nut

A. After installing the Support Angle, install the Main Cam Push Nut with Needlenose Pliers etc. so that it is flush with the chassis.

There may be some slight scratches on the Shaft of Main Cam Gear, when removing the Main Cam Gear. In case that the Main Cam Gear can be installed securely without tottering, it is fine to use the one. If any tottering, installall new parts.

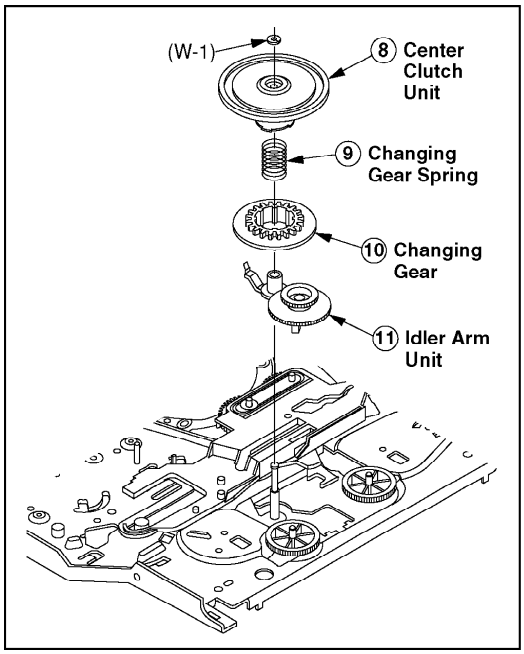
Fig. J3-6



6. The Main Cam Push Nut is not reusable. Install a new one.

5.2.6. Center Clutch Unit, Changing Gear Spring, Changing Gear, and Idler Arm Unit

Fig. J4-1

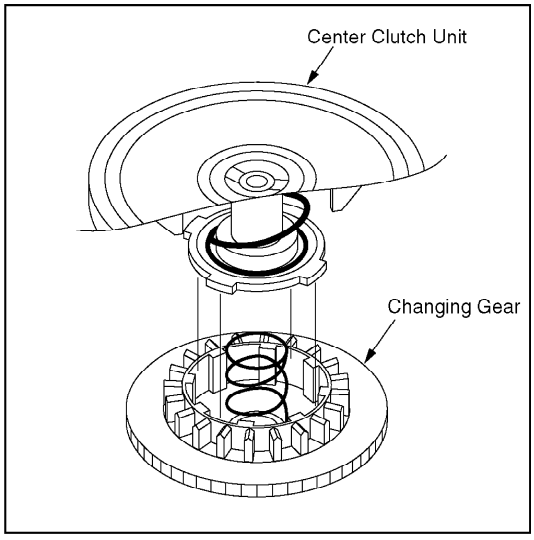


5.2.6.1. Reassembly Notes

1. Installation of Center Clutch Unit

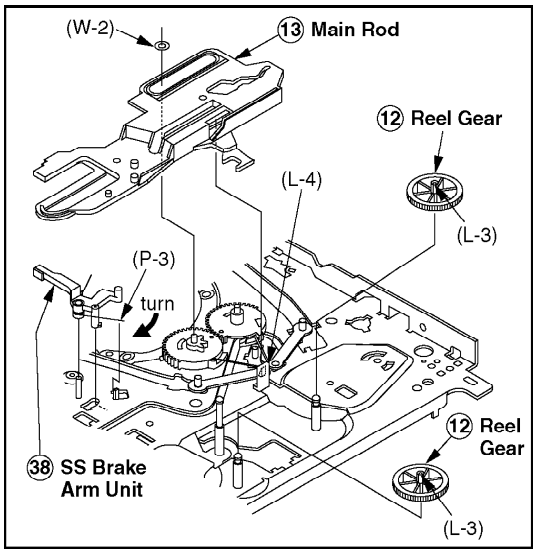
A. Fit the Center Clutch Unit into the Changing Gear.

Fig. J4-2



5.2.7. Reel Gear, Main Rod, and SS Brake Arm Unit

Fig. J5-1

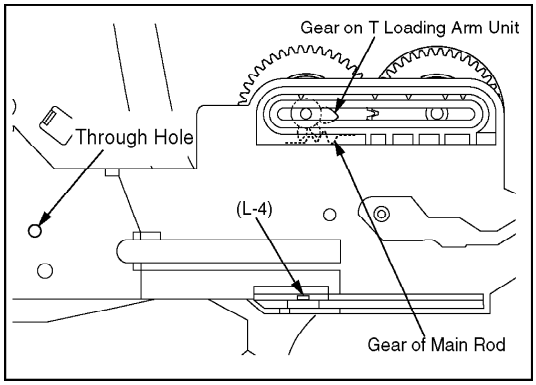


5.2.7.1. Reassembly Notes

1. Alignment of Main Rod and T Loading Arm Unit

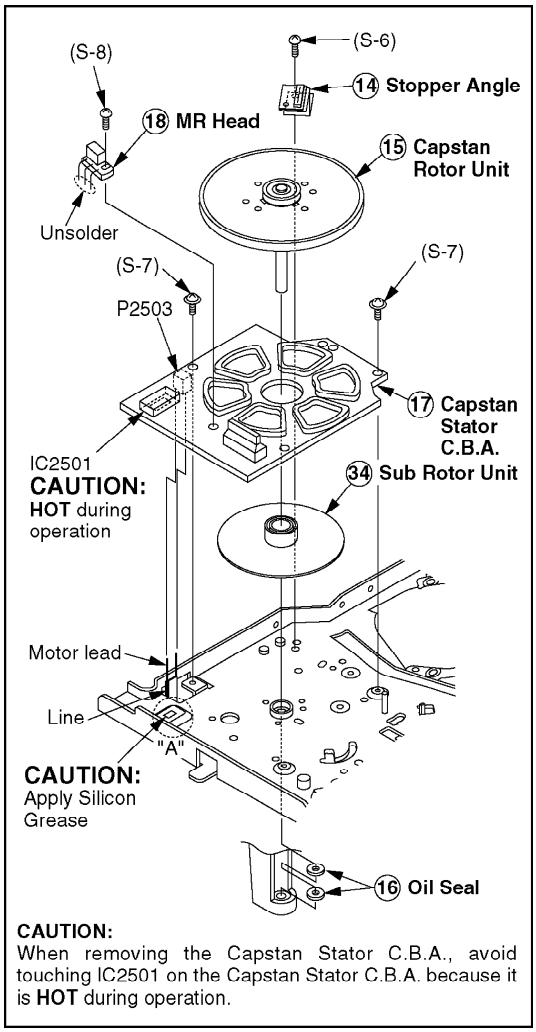
A. Align the Gear of T Loading Arm Unit with Gear of Main Rod. Confirm that the Hole on Main Rod is a Through Hole with a hole on chassis.

Fig. J5-2



5.2.8. Stopper Angle, Capstan Rotor Unit, Oil Seal, Capstan Stator C.B.A., MR Head, and Sub Rotor Unit

Fig. J6-1



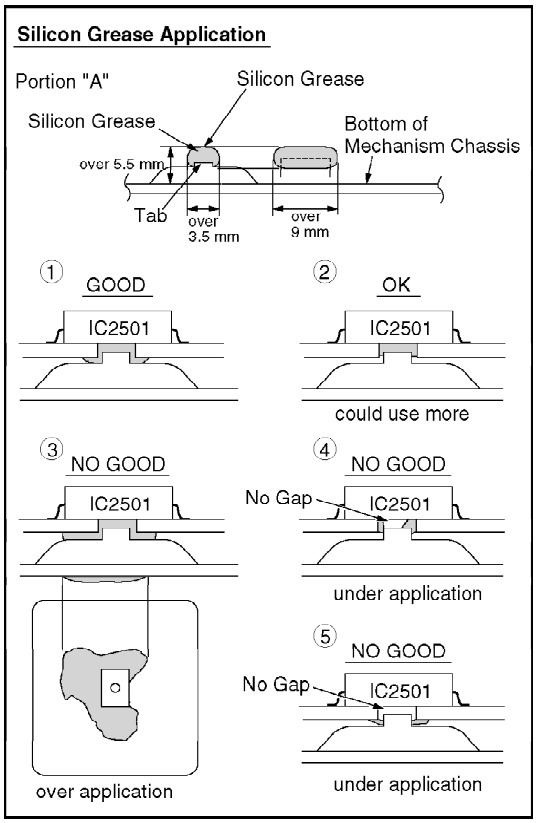
5.2.8.1. Reassembly Notes

1. Application of Silicon Grease

CAUTION:

When installing the IC2501 (AN3846SC) or Capstan Stator C.B.A., be sure to apply Silicon Grease (VFK1301) as shown. Be careful not to touch other parts with greased portion to prevent grease depletion.

Fig. J6-2

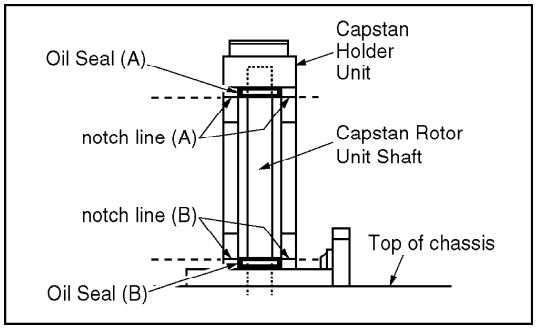


2. Installation of Capstan Rotor Unit and Oil Seal

A. Install the 2 Oil Seals into the Capstan Holder Unit. Then, insert the Capstan Rotor Unit Shaft into the hole of the Capstan Holder Unit so that shaft passes through 2 Oil Seals. Be carefulnot to scratch the Shaft or Capstan Holder Unit.

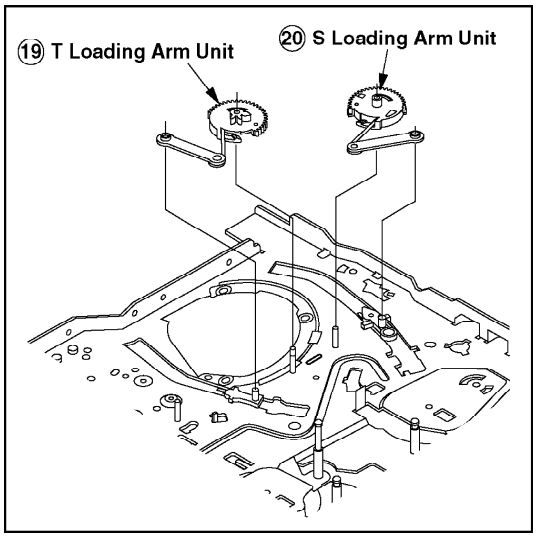
B. Align the bottom of Oil Seal (A) with notch line (A). Align the top of Oil Seal (B) with notch line (B).

Fig. J6-3



5.2.9. T Loading Arm Unit and S Loading Arm Unit

Fig. J7-1



5.2.9.1. Reassembly Notes

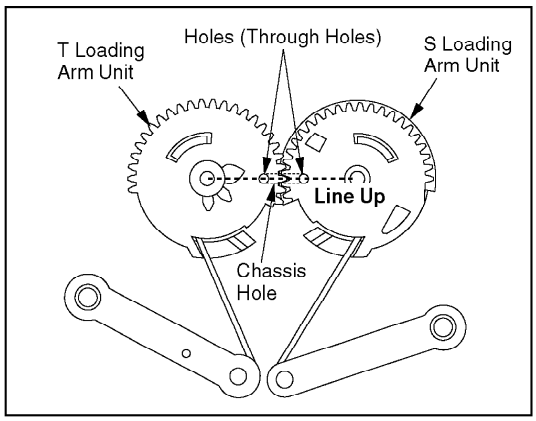
1. Alignment of T Loading Arm Unit and S Loading Arm Unit

A. Install the S Loading Arm Unit onto the chassis.

B. Install the T Loading Arm Unit so that the hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.

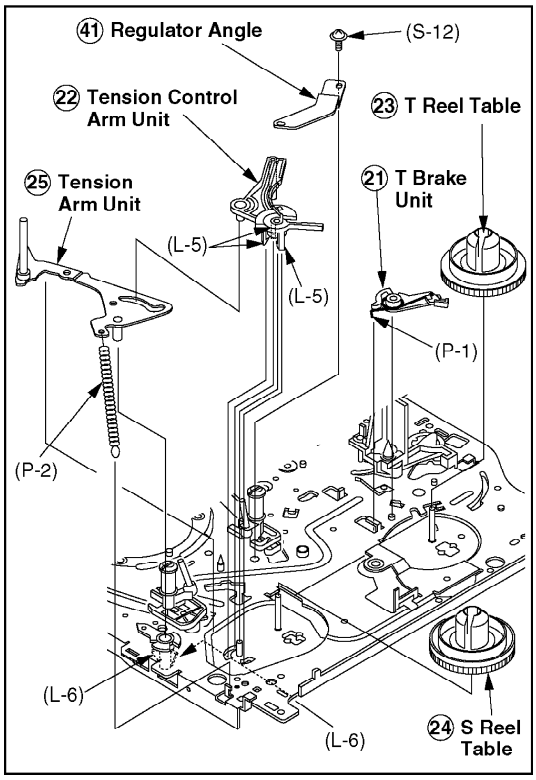
C. Confirm that the holes on the S& T Loading Arm Unit are Through Holes with hole on chassis.

Fig. J7-2



5.2.10. T Brake Unit, Tension Control Arm Unit, T Reel Table, S Reel Table, Tension Arm Unit, and Regulator Angle

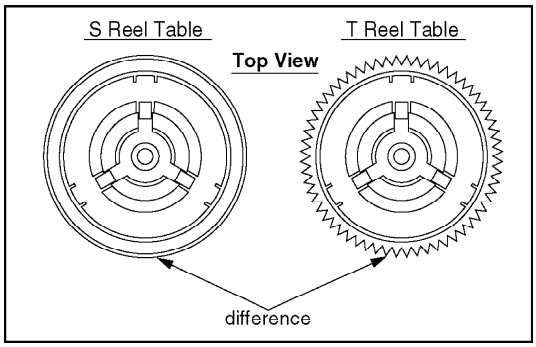
Fig. J8-1



5.2.10.1. Reassembly Notes

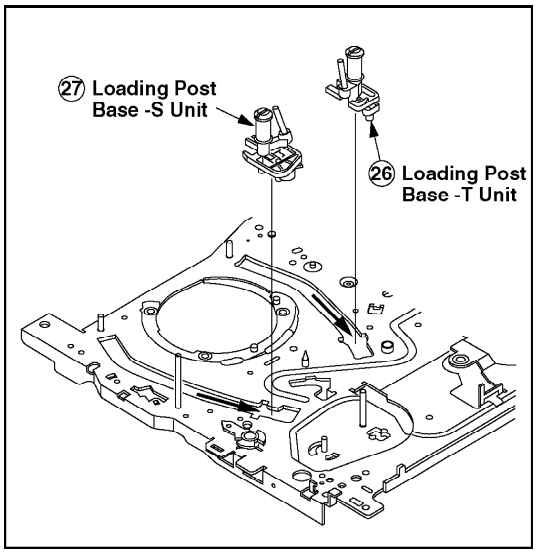
1. How to distinguish between S Reel Table and T Reel Table

Fig. J8-2



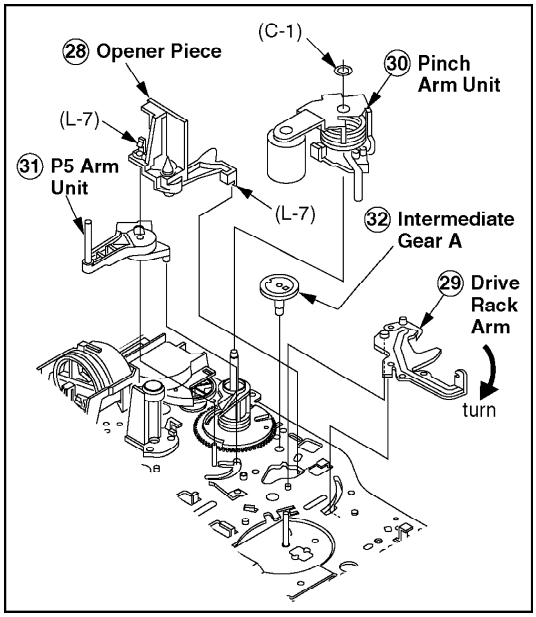
5.2.11. Loading Post Base -T Unit and Loading Post Base -S Unit

Fig. J9



5.2.12. Opener Piece, Drive Rack Arm, Pinch Arm Unit, P5 Arm Unit, and Intermediate Gear A

Fig. J10-1



5.2.12.1. Reassembly Notes

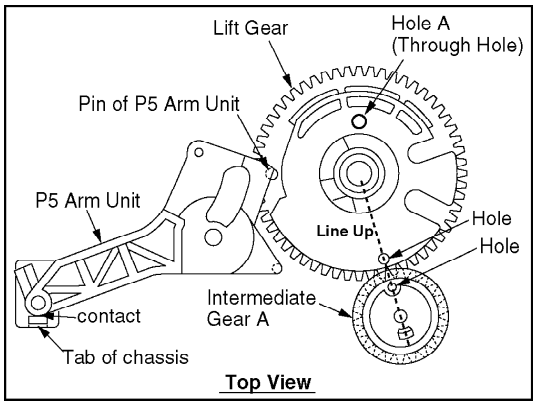
1. Installation/Alignment of Intermediate Gear A, Lift Gear and P5 Arm Unit

A. Rotate the Lift Gear so that Hole A on Lift Gear is a Through Hole with a hole on chassis.

B. Install the Intermediate Gear A so that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

C. Install the P5 Arm Unit so that it contacts with the tab of chassis.

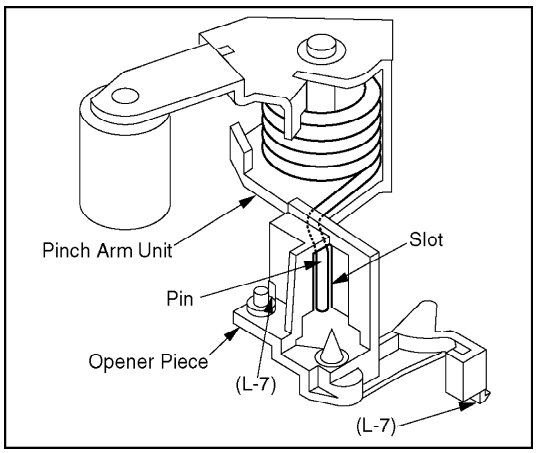
Fig. J10-2



2. Installation of Opener Piece

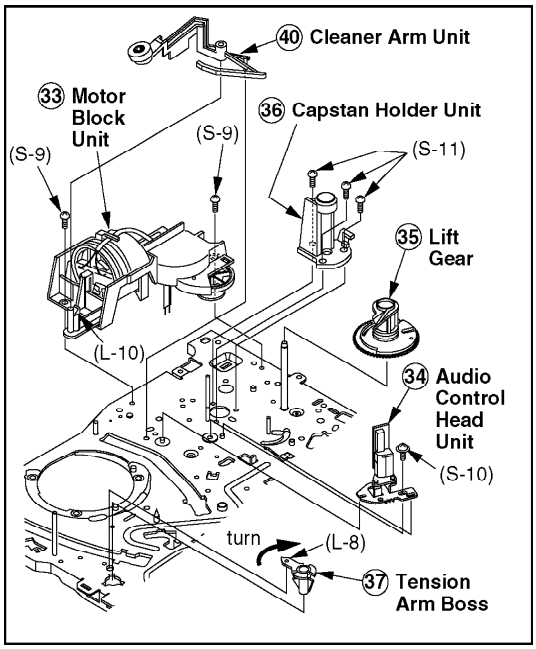
A. Install the Opener Piece so that the slot of the Opener Piece is inserted to the Pin of Pinch Arm Unit

Fig. J10-3



5.2.13. Motor Block Unit, Audio Control Head Unit, Lift Gear, Capstan Holder Unit, Tension Arm Boss, and Cleaner Arm Unit

Fig. J11



5.3. CASSETTE UP ASS'Y SECTION

This chart indicates Step/Location No. of Parts to be serviced and prior steps to gain access items to be serviced when disassembling. When reassembling, perform the step(s) in the reverse order.

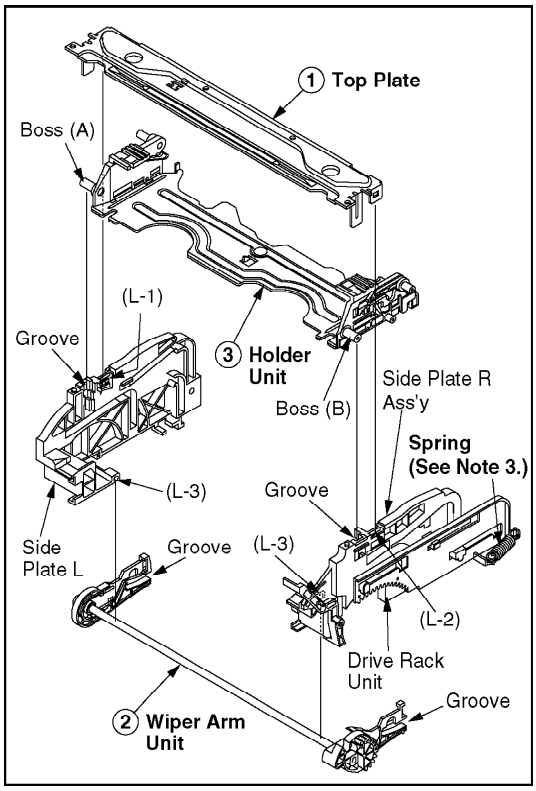
Step/Loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	----------	Top Plate	K1-1	(L-1), (L-2)	
②	1	Wiper Arm Unit	K1-1	2(I -3)	Gear Alignment
③	1,2	Holder Unit	K1-1	-	
④	----------	Opener Lever	K2	2(L-4)	
⑤	1,2,3,4	Drive Rack Unit	K2	-	
	A	B C	D	E	F

How to read chart shown above:

A: Order of Procedure steps.
When reassembling, perform steps(s) in reverse order.
These numbers are also used as the identification (location) No. of parts in Figures.
B: Steps to be completed prior to the current step.
C: Part to be removed or installed.
D: Fig. No. showing Procedure or Part Location.
E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.
(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1),
(W-1) = Washer (W-1), (P-1) = Spring (P-1),
(C-1) = Cut Washer (C-1)
F: Alignment/Adjustment which is required when installing or replacing each Parts.

5.3.1. Top Plate, Wiper Arm Unit, and Holder Unit

Fig. K1-1



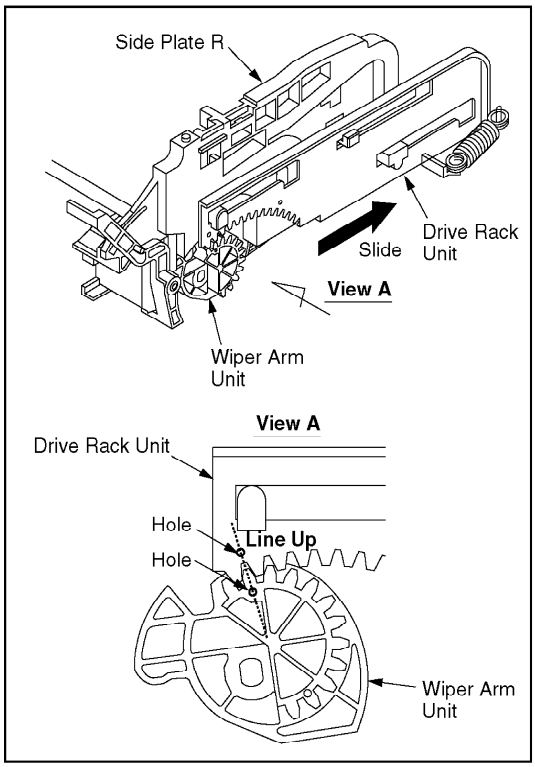
5.3.1.1. Reassembly Notes

1. Alignment of Wiper Arm Unit and Drive Rack Unit

A. Slide the Drive Rack Unit to the far right as indicated by the arrow.

B. Install the Wiper Arm Unit so that the hole on the Wiper Arm Unit is aligned with the hole on the Drive Rack Unit.

Fig. K1-2



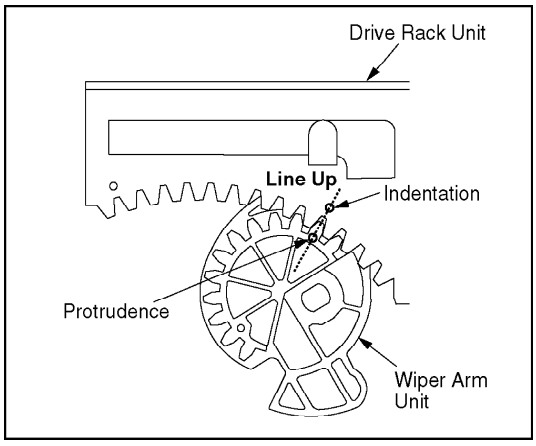
2. Installation of Holder Unit

A. Turn the Wiper Arm Unit so that the grooves on each end are aligned with the each groove on Side Plate L and R.

B. Insert Holder Unit boss (A) and (B) into the grooves as shown in Fig. K1-1.

C. Finally, in the EJECTPosition, confirm that the protrudence on the Wiper Arm Unit is aligned with the indentation on the Drive Rack Unit.

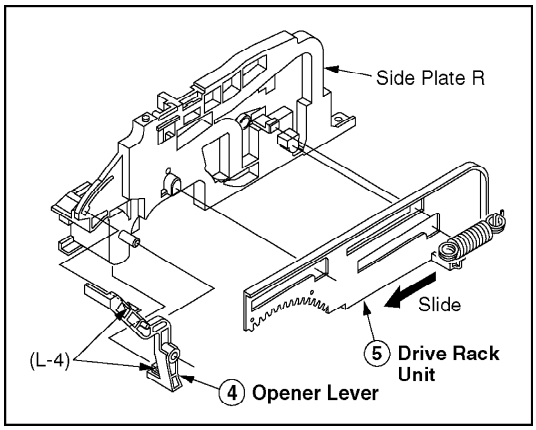
Fig. K1-3



3. Make sure to hook the spring to the Drive Rack Arm of Mechanism chassis.

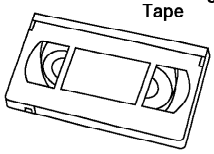
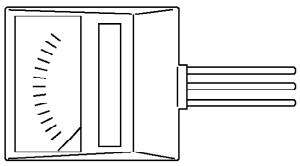
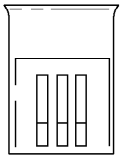
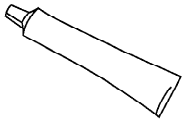
5.3.2. Opener Lever and Drive Rack Unit

Fig. K2



6. ADJUSTMENT PROCEDURES

6.1. SERVICE FIXTURES AND TOOLS

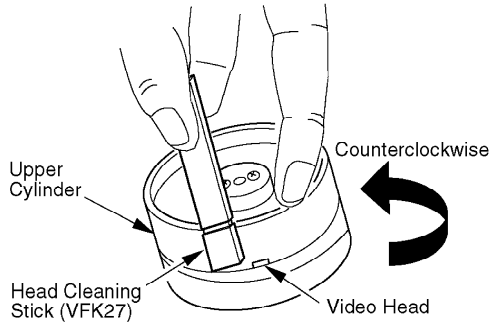
VFMS0003H6 VHS Alignment Tape  Video: Color Bar & Monoscope Audio: 6kHz(MONO)	Back Tension Meter (Made in USA., Purchase Locally) 	VFK27 Head Cleaning Stick 
VFK1301 Silicon Grease 	VFKS0081 Grease 	VFK0329 Post Adjustment Driver
VFK0330 H-Position Adjustment Driver 		

6.2. MECHANICAL ADJUSTMENT

6.2.1. CLEANING PROCEDURE FOR THE UPPER CYLINDER UNIT

1. While slowly turning the Upper Cylinder Unit counterclockwise by hand, gently rub the Video Heads with a Head Cleaning Stick (VFK27) moistened with Ethanol.
When using a Cleaning Cassette, make sure to use "DRY" type only and be aware that excessive use can shorten head life.

Fig. M1



Note:

A. Do not rub vertically or apply excess pressure to the Video Heads.
Do not turn the Upper Cylinder Unit clockwise while cleaning.

B. After cleaning, use a Dry Head Cleaning Stick (VFK27) to remove any Ethanol remaining on the cylinder tape path. Otherwise, tape damage will occur.

6.2.2. ADJUSTMENT PROCEDURES BACK TENSION CONFIRMATION

Purpose:

To fine adjust the Back Tension so that the tape runs smoothly with a constant tension.

Symptom of Misadjustment:

1) If the tape tension is less than the specified value, the tape cannot come into proper contact with the Video Heads, resulting in poor picture playback.
2) If the tape tension is too high, the tape will soon be damaged.

Equipment Required:

Back Tension Meter (Made in U.S.A., Purchase Locally)
VHS Cassette Tape (120-Minute Tape)

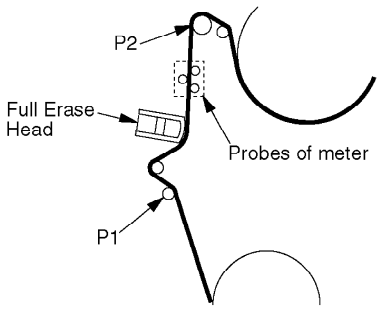
Specification:

20 gf±2.5 gf
(0.196 N±0.025 N)

1. Play back a T120 cassette tape from the beginning for approx. 10 to 20 seconds to stabilize tape movement.

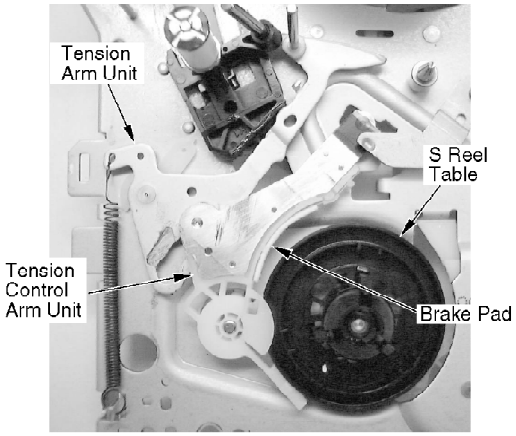
2. Insert a Tension Meter into tape path and measure the back tension.

Fig. M2-1



3. If the reading is out of specification, make sure that there is no dust or foreign material between the Brake Pad of Tension Control Arm Unit and the S Reel Table.
After cleaning, the reading of tension measurement is still out of specification, replace the Tension Arm Unit and the Tension Control Arm Unit.

Fig. M2-2



Note:

A. Be sure that the three probes of the meter are all in solid contact with the tape, but not touching any other parts of the mechanism.

B. It is recommended that measurements should be repeated at least three (3) times because the tension meter is very sensitive to external vibrations.

6.2.2.1. MR HEAD GAP ADJUSTMENT

Purpose:

To properly pick up the FG Signal.

Symptom of Misadjustment:

If the FG Signal is not properly picked up, Servo Operation cannot

be achieved.

Equipment Required:

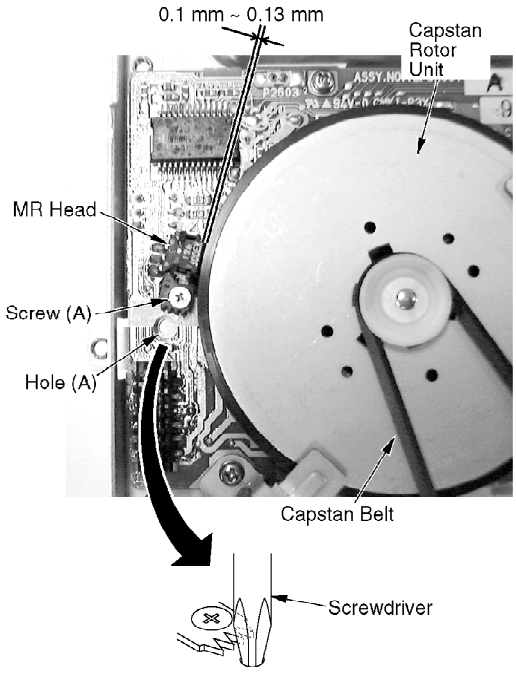
Oscilloscope

Specification:

0.1 mm ~ 0.13 mm

1. Remove the VCR Chassis Unit and then place it upside down.
2. Remove the Main C.B.A.
3. Slightly loosen Screw (A). Then set the Screwdriver (Phillips Driver) into the Hole (A). Turn the screwdriver clockwise until the MR Head touches the rotor. Then turn it slightly counterclockwise to make theclearance as specified.
4. Tighten Screw (A).
5. Reinstall the Main C.B.A.

Fig. M3-1



Note:

Do not touch the outside circumference of the rotor surface with any tool and keep magnetic material away from the rotor magnet (especially metal particles).

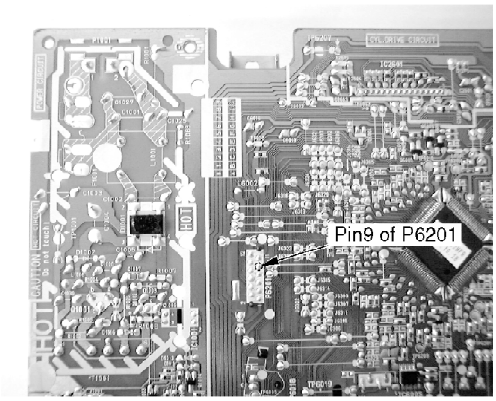
Confirmation of Signal Level

1. Place the unit in Service Position (2). Refer to "SERVICE POSITION

" in SERVICE NOTES.

2. Supply a Video Signal to the video input jack.
3. Insert a cassette tape and place the unit in SLP recording mode.
4. Connect the oscilloscope to Pin 9 of P6201 on the Main C.B.A. Confirm that the signal level is greater than 20 mV [P-P].

Fig. M3-2



Main C.B.A. (foil side)

6.2.2.2. TAPE INTERCHANGEABILITY ADJUSTMENT

Note:

To perform these adjustment/confirmation procedures, enter the Tracking center mode.

Equipment Required:

Dual Trace Oscilloscope
VHS Alignment Tape (VFMS0003H6)
Post Adjustment Driver (VFK0329)
H-Position Adjustment Driver (VFK0330)

6.2.2.2.1. ENVELOPE OUTPUT ADJUSTMENT

The height of the P2 and P3 Posts replacement part is preadjust at the factory.

Purpose:

To achieve a satisfactory picture and secure precise tracking.

Symptom of Misadjustment:

If the envelope is output poorly, much noise will appear in the picture. Then the tracking will lose precision and the playback picture will be distorted by any slight variation of the tracking control circuit.

Equipment Required:

Post Adjustment Driver (VFK0329)

1. **Insert the alignment tape.**
2. **Press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.**
   The power comes on and the unit goes into service mode.
3. **Play back the alignment tape.**
4. **To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.**
5. **Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.**
6. **Confirm that the RF envelope is flat enough (V1/V-max. is 0.7 or more). If not, with Post Adjustment Driver, adjust P2 and P3 post height so that the envelope waveform becomes as flat (V1/V-max.is 0.7 or more) as possible (No envelope drop). If the envelope drop appears on the left-half of the waveform, adjust P2 post height. If the envelope drop appears on the right-half of the waveform, adjust P3 post height.**

   CAUTION:

   Overtightening P2 and P3 posts may cause the threads to strip.

   Note:

   It will be possible to confirm Step 6 according to following steps.

   A. Release the Tracking center mode.

   B. Press the Tracking Control Up or Down button on remote control. Make sure that the envelope waveform remains flat. If not, readjust P2 and/or P3 post heights.

Fig. M4-1

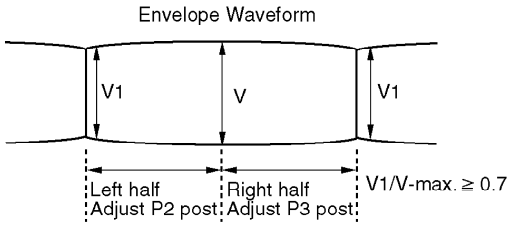
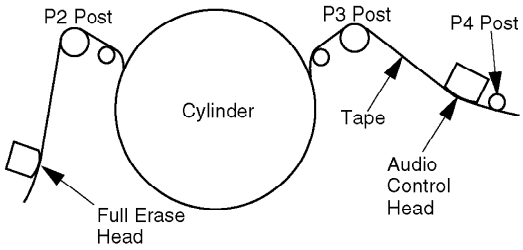
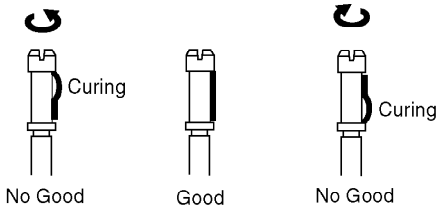


Fig. M4-2



7. After adjustment, confirm that the tape travels without curling at P2 and P3 posts.

Fig. M4-3



8. To release from Tracking center mode, press PLAY or STOP button.

6.2.2.2.2. AUDIO CONTROL HEAD TILT ADJUSTMENT

Purpose:

To confirm that the tape runs smoothly. In particular, confirm that the tape properly picks up the Audio Signal at the upper part of the head and the Control Signal at the lower part of the head.

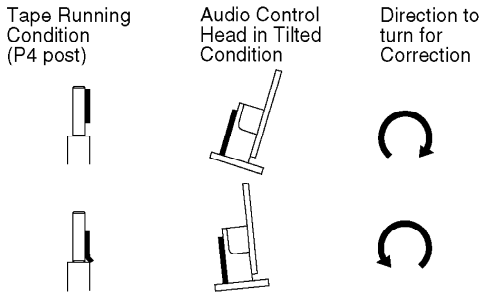
Symptom of Misadjustment:

If the tilt of the Audio Control Head is poorly adjusted, the tape will eventually be damaged. An intermittent Blue screen may be seen in Playback.

1. Play back a T120 cassette tape and check that the tape travels smoothly between the upper and lower guides of the P4 post.

2. If necessary, adjust Black Screw (B) clockwise until the tape begins to curl at the lower edge of the P4 post. Then adjust the screw counterclockwise until the curling is eliminated.

Fig. M5



6.2.2.2.3. AUDIO CONTROL HEAD HEIGHT ADJUSTMENT

The height of the Audio Control Head replacement part is preset at the factory.

Purpose:

To be sure the tape runs properly along the Control Head.

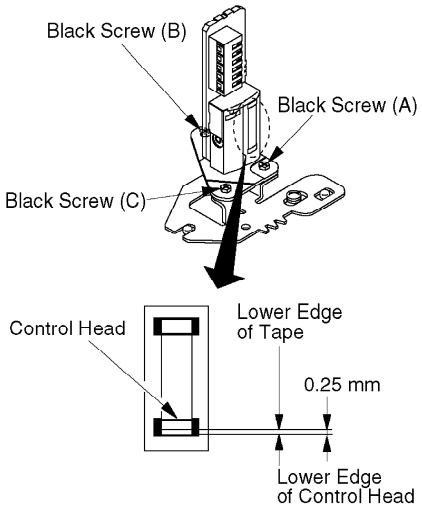
Symptom of Misadjustment:

If the control signal is not properly picked up, Servo Operation cannot be achieved. A Blue screen will be seen in Playback.

This confirmation is required when the Audio Control Head is replaced.

1. **Play back a T120 cassette tape and check that the lower edge of the tape runs approximately 0.25 mm above the lower edge of the Audio Control Head.**
2. **If necessary, adjust Black Screws (A) and (B) clockwise to lower the tape or counterclockwise to raise.**

Fig. M6



6.2.2.2.4. AUDIO CONTROL HEAD AZIMUTH ADJUSTMENT

Purpose:

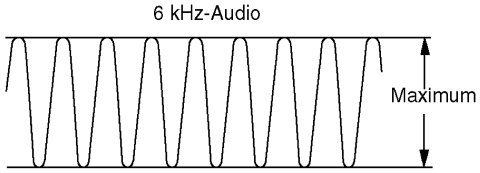
To adjust the position and height of the Audio Control Head so that it meets the tape tracks properly.

Symptom of Misadjustment:

If the position of the Audio Control Head is not properly adjusted, the Audio S/N Ratio is poor.

1. **Connect the oscilloscope to the audio output jack on the rear side of the deck.**
2. **Play back the 6 kHz Monaural Audio portion of the alignment tape.**
3. **Adjust Black Screw (C) on the Audio Control Head base so that the output level is at maximum.**

Fig. M7



4. **Confirm the height of the Audio Control Head is proper. If not, readjust Black Screws (A) and (B).**

6.2.2.2.5. AUDIO CONTROL HEAD HORIZONTAL POSITION ADJUSTMENT

Purpose:

To adjust the Horizontal Position of the Audio Control Head.

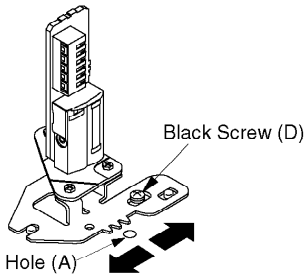
Symptom of Misadjustment:

If the Horizontal Position of the Audio Control Head is not properly adjusted, a maximum envelope cannot be obtained at the Neutral Position of the Tracking Control Circuit.

1. **Insert the alignment tape.**
2. **Press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.**
   The power comes on and the unit goes into service mode.
3. **Play back the alignment tape.**
4. **To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.**
5. **Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.**
6. **Loosen the Black Screw (D) and tighten it slightly. Set the H-Position Adjustment Driver into the Hole (A). Then slowly turn the**

fixture either clockwise or counterclockwise so that the envelope is at maximum.

Fig. M8



7. Tighten Black Screw (D).
8. To release from Tracking center mode, press PLAY or STOP button.

Note:

Old type of H-Position Adjustment Driver (VFK0136) can be used for this adjustment.

6.3. ELECTRICAL ADJUSTMENT

6.3.1. EVR (Electronic Variable Resister) ADJUSTMENT WITH THE REMOTE CONTROL

This unit has electronic technology using I2C Bus concept.
The PG SHIFTER ADJUSTMENT is adjusted by using " On Screen Display " and the remote control instead of adjusting mechanical controls (VR).

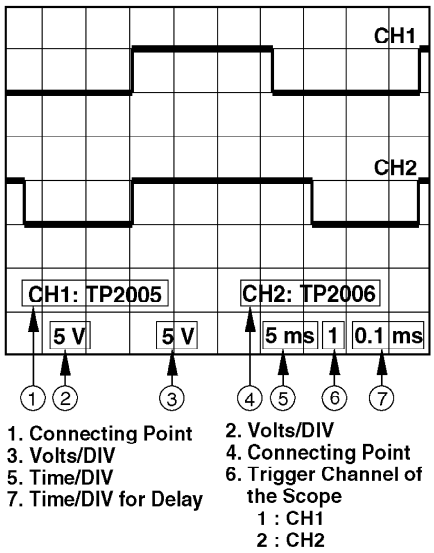
6.3.2. TEST EQUIPMENT

To do all of these electrical adjustments, the following equipment is required.

1. Dual-Trace Oscilloscope
   Voltage Range: 0.001 V to 50 V/Div.
   Frequency Range: DC to 50 MHz
   Probes: 10:1, 1:1
2. NTSC Video Pattern Generator
3. Plastic Tip Driver and Non-Metal Driver
4. Isolation Transformer (Variable)
5. VHS Alignment Tape (VFMS0003H6)
6. Blank Tape
7. TV monitor

6.3.3. HOW TO READ THE ADJUSTMENT PROCEDURES

Fig. E1



6.3.4. PG SHIFTER ADJUSTMENT

Purpose:

Determine the Video Head Switching Point during Playback.

Symptom of Misadjustment:

May cause Head Switching Noise and/or Vertical Jitter.

Test Point:

TP3001 (Main C.B.A.),
TP6205 (Main C.B.A.)

Specification:

T= 6 H±0.5 H (0.38 ms±0.03 ms)

Mode:

SP Playback

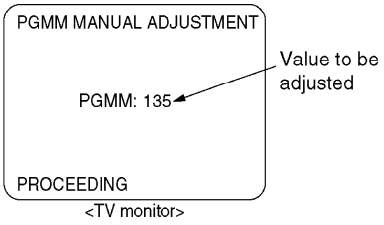
Equipment:

Oscilloscope,
VHS Alignment Tape (VFMS0003H6),
TV monitor

1. Insert the VHS Alignment Tape and play back in SP mode.
2. Press VCR/TV button on the unit and 3 button on the remote control together to enter EVR PG SHIFTER ADJUSTMENT Mode. Then, "PGMM MANUAL ADJUSTMENT" menu will appear on the

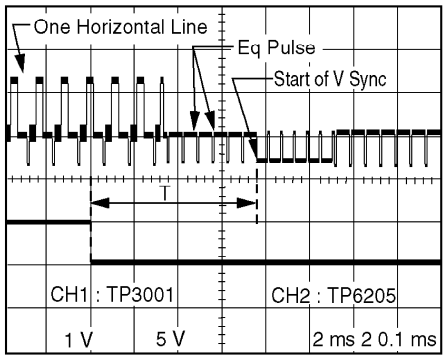
TV monitor.

Fig. E2-1



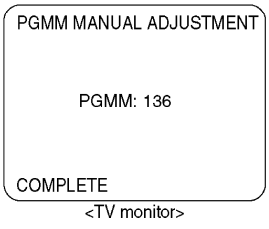
3. **Connect the channel-1 scope probe to TP3001 and the channel-2 scope probe to TP6205. Used TP6205 as a trigger.**
4. **Adjust value so that the trailing edge of the head switching pulse is placed 6 H±0.5 H (0.38 ms±0.03 ms) before the start of the vertical sync pulse by pressing CH UP and CH DOWN buttonson the remote control.**

Fig. E2-2



5. **After adjustment is completed, press REC button on the remote control. Then " COMPLETE " will appear on the TV monitor and adjusted value will be written to Memory IC (IC6005).**

Fig. E2-3



6. **Press STOP button on the remote control to release from EVR PG SHIFTER ADJUSTMENT MODE.**

6.3.5. CHROMINANCE NOISE REDUCTION ADJUSTMENT (CNR)

Purpose:

To improve the Playback Chroma S/N.

Symptom of Misadjustment:

Playback interchangeability is inadequate.

Test Point:

TP3004 (Main C.B.A.)

Adjustment:

R3204, R3205 (Main C.B.A.)

Specification:

Less than 50 mV[p-p]

Input:

Video Input Jack
NTSC Color Bar (W/WHITE WINDOW)

Mode:

SP self recording and playback

Equipment:

Oscilloscope,
NTSC Video Pattern Generator,
Blank Tape

1. **Supply NTSC Color Bar Signal to the Video Input Jack and make a recording in SP mode.**
2. **Playback the recording and adjust R3204 (CNR PHASE) and R3205 (CNR GAIN) alternately so that the Chroma Signal at TP3004 is at minimum.**
3. **Make sure that the Chroma Signal at TP3004 is less than 50 mV[p-p].**

Fig. E3-1 (before adjustment)

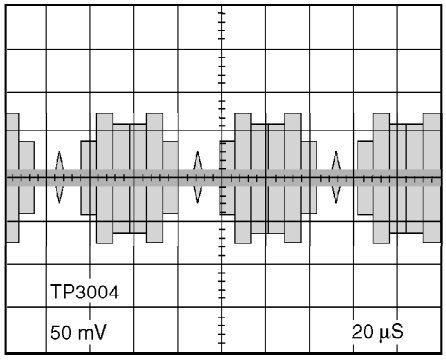
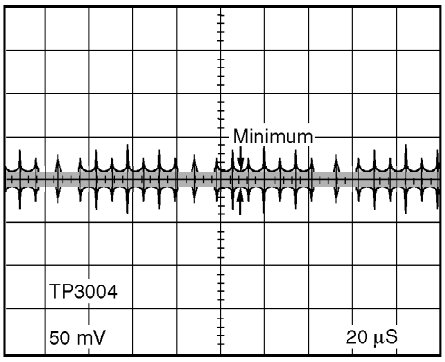
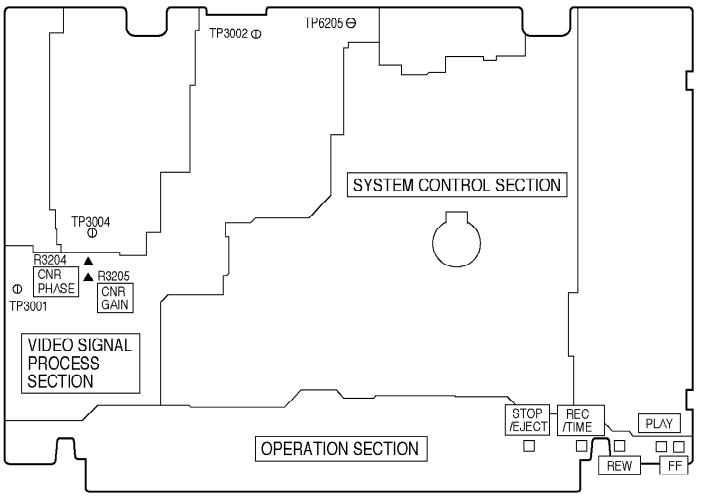


Fig. E3-2 (after adjustment)



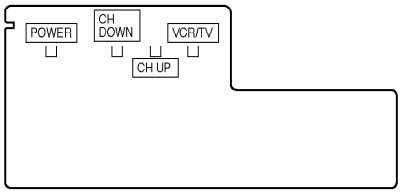
6.4. TEST POINTS AND CONTROL LOCATION

Main C.B.A.



(Component Side)

Operation C.B.A.



(Component Side)

FUNCTION OF IMPORTANT TEST POINTS	
TP3001	Video Signal to Jack
TP3002	REC/PB Video envelope signal
TP3004	CNR Signal
TP6205	Head SW.

Test Point Information

Ⓣ Test Point with a jumper wire across a hole in the P.C.B.

7. SCHEMATIC DIAGRAMS

7.1. SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES

7.2. MAIN I (SYSTEM CONTROL/SERVO) SCHEMATIC DIAGRAM

7.3. MAIN II (SIGNAL PROCESS/AUDIO) SCHEMATIC DIAGRAM

7.4. MAIN III (POWER SUPPLY) SCHEMATIC DIAGRAM

7.5. MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM

7.6. MAIN V (OPERATION) SCHEMATIC DIAGRAM

7.7. MAIN VI (CYLINDER DRIVE/ADVANCE) SCHEMATIC DIAGRAM

7.8. OPERATION SCHEMATIC DIAGRAM

7.9. Hi-Fi AUDIO/VIDEO HEAD AMP/ AUDIO CONTROL HEAD SCHEMATIC DIAGRAM

7.10. CAPSTAN STATOR SCHEMATIC DIAGRAM

7.11. INTERCONNECTION SCHEMATIC DIAGRAM

7.12. SIGNAL WAVEFORM

7.13. VOLTAGE CHART

8. CIRCUIT BOARD LAYOUT

8.1. MAIN C.B.A.

8.2. OPERATION C.B.A./ Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A./ CAPSTAN STATOR/ AUDIO CONTROL HEAD P.C.B.

9. BLOCK DIAGRAMS

9.1. POWER SUPPLY BLOCK DIAGRAM

9.2. VIDEO SIGNAL PATH BLOCK DIAGRAM

9.3. AUDIO SIGNAL PATH BLOCK DIAGRAM

9.4. Hi-Fi AUDIO SIGNAL PATH BLOCK DIAGRAM

9.5. SYSTEM CONTROL BLOCK DIAGRAM

9.6. SERVO BLOCK DIAGRAM

9.7. OPERATION BLOCK DIAGRAM

9.8. ADVANCE BLOCK DIAGRAM

10. EXPLODED VIEWS

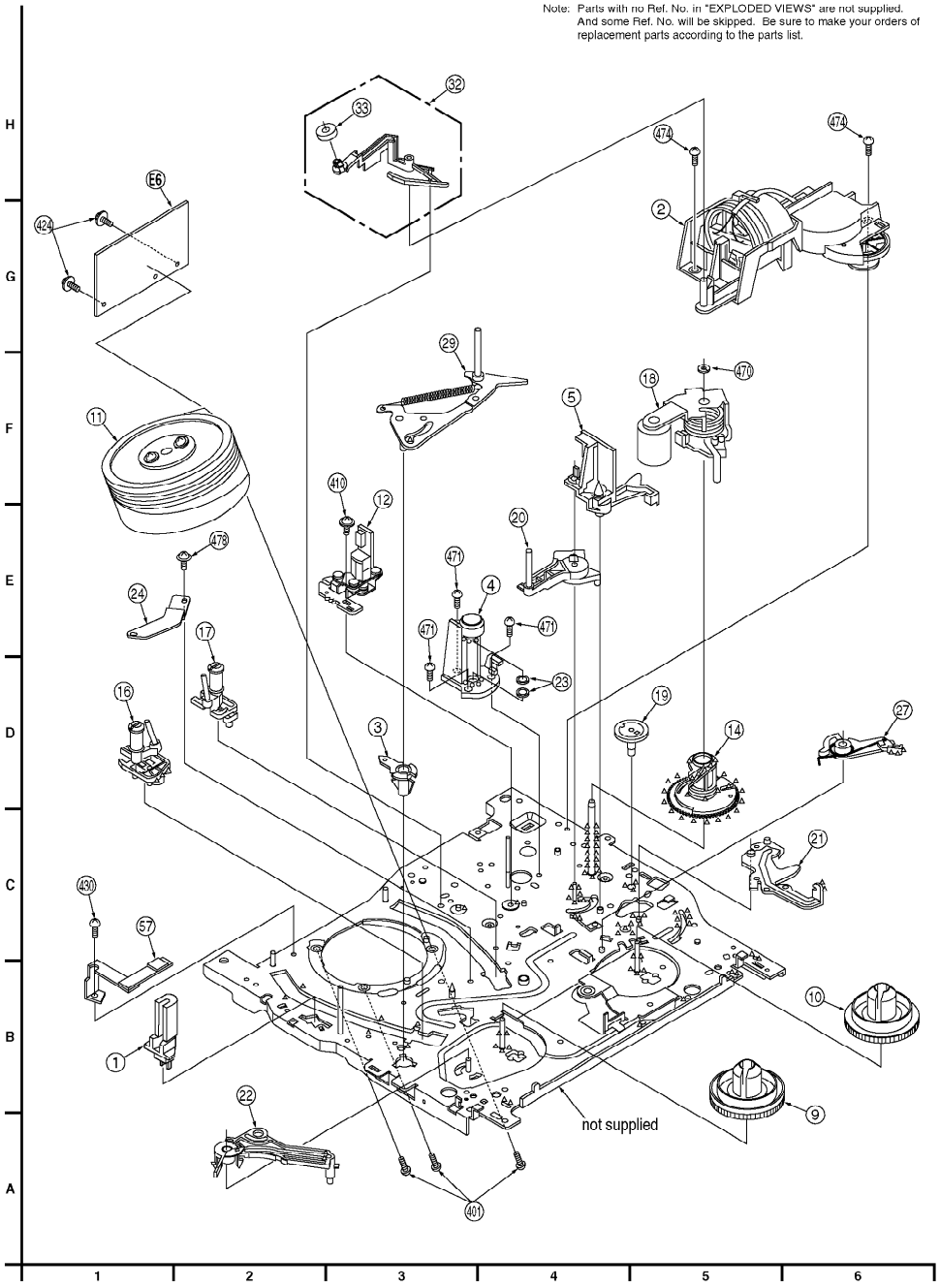
10.1. MECHANISM (TOP) SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
OOO	Spindle Oil	Purchase from Local Supplier	- - - - - - - -
ΔΔΔ	Grease	Available from Factory	VFKS0081

Note: Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied.
And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.

❶ MECHANISM (TOP) SECTION

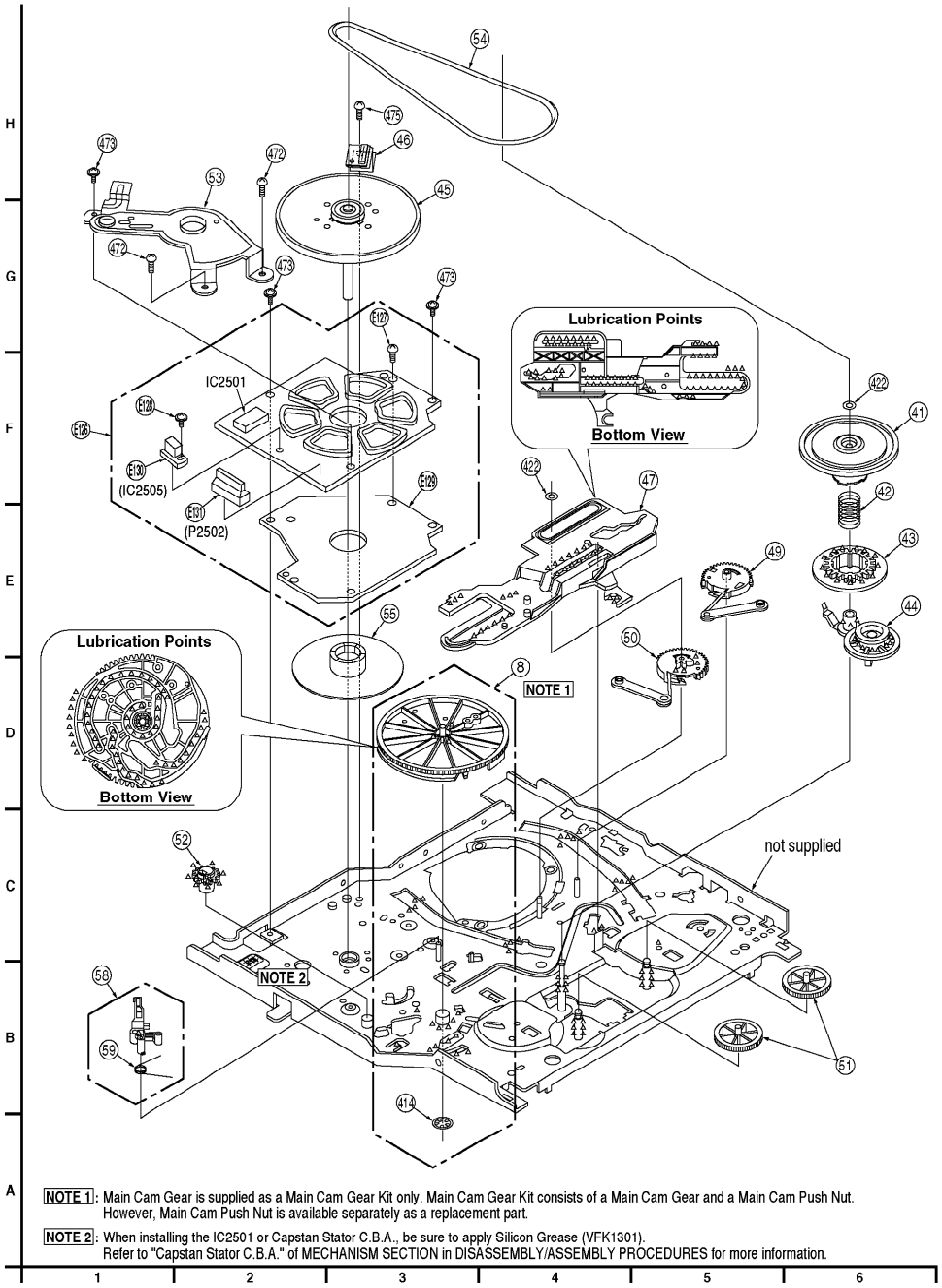


10.2. MECHANISM (BOTTOM) SECTION

❷ MECHANISM (BOTTOM) SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
XXX	Silicon Grease	Available from Factory	VFK1301
△△△	Grease	Available from Factory	VFKS0081



NOTE 1: Main Cam Gear is supplied as a Main Cam Gear Kit only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.

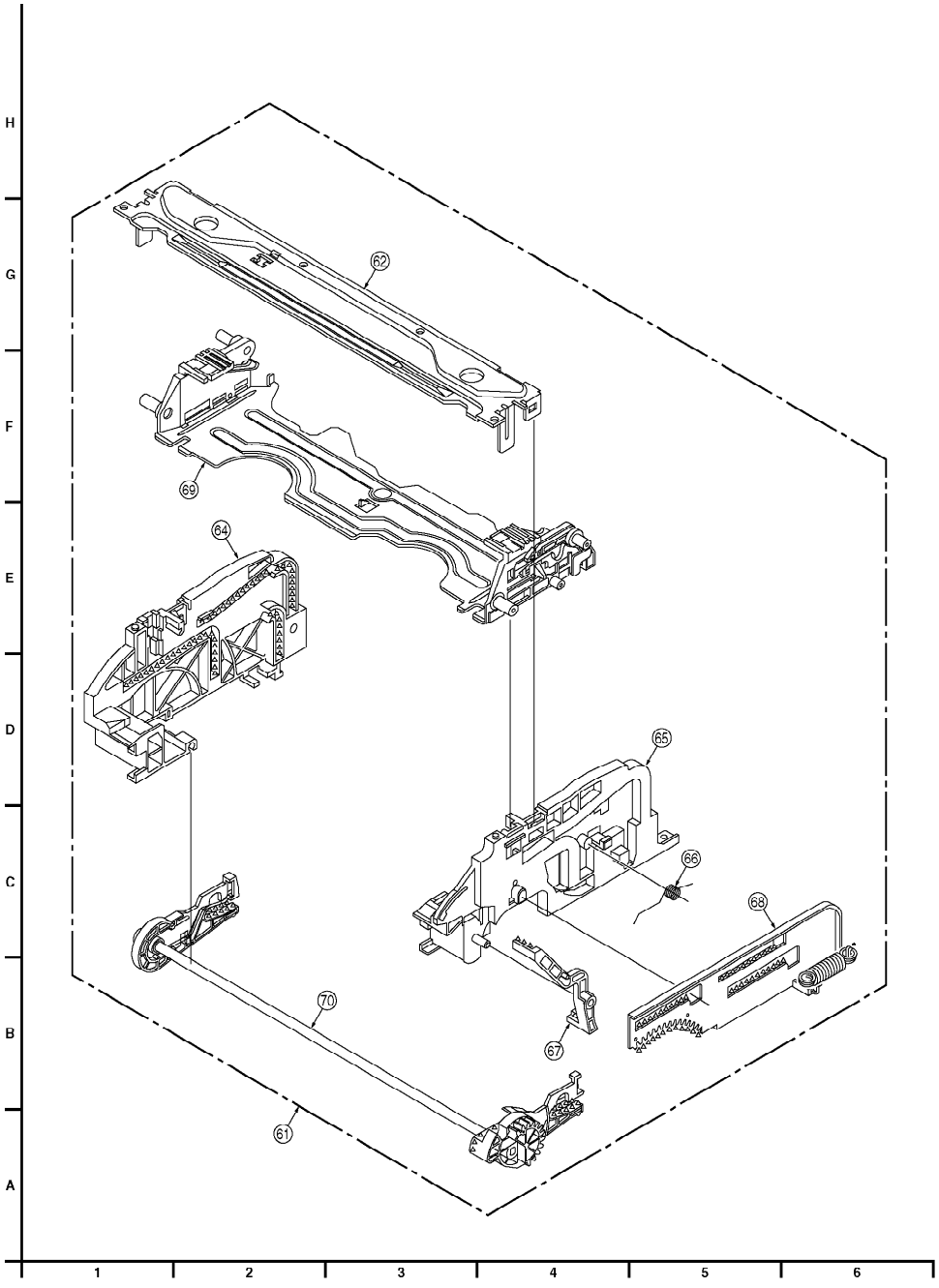
NOTE 2: When installing the IC2501 or Capstan Stator C.B.A., be sure to apply Silicon Grease (VFK1301). Refer to "Capstan Stator C.B.A." of MECHANISM SECTION in DISASSEMBLY/ASSEMBLY PROCEDURES for more information.

10.3. CASSETTE UP COMPARTMENT SECTION

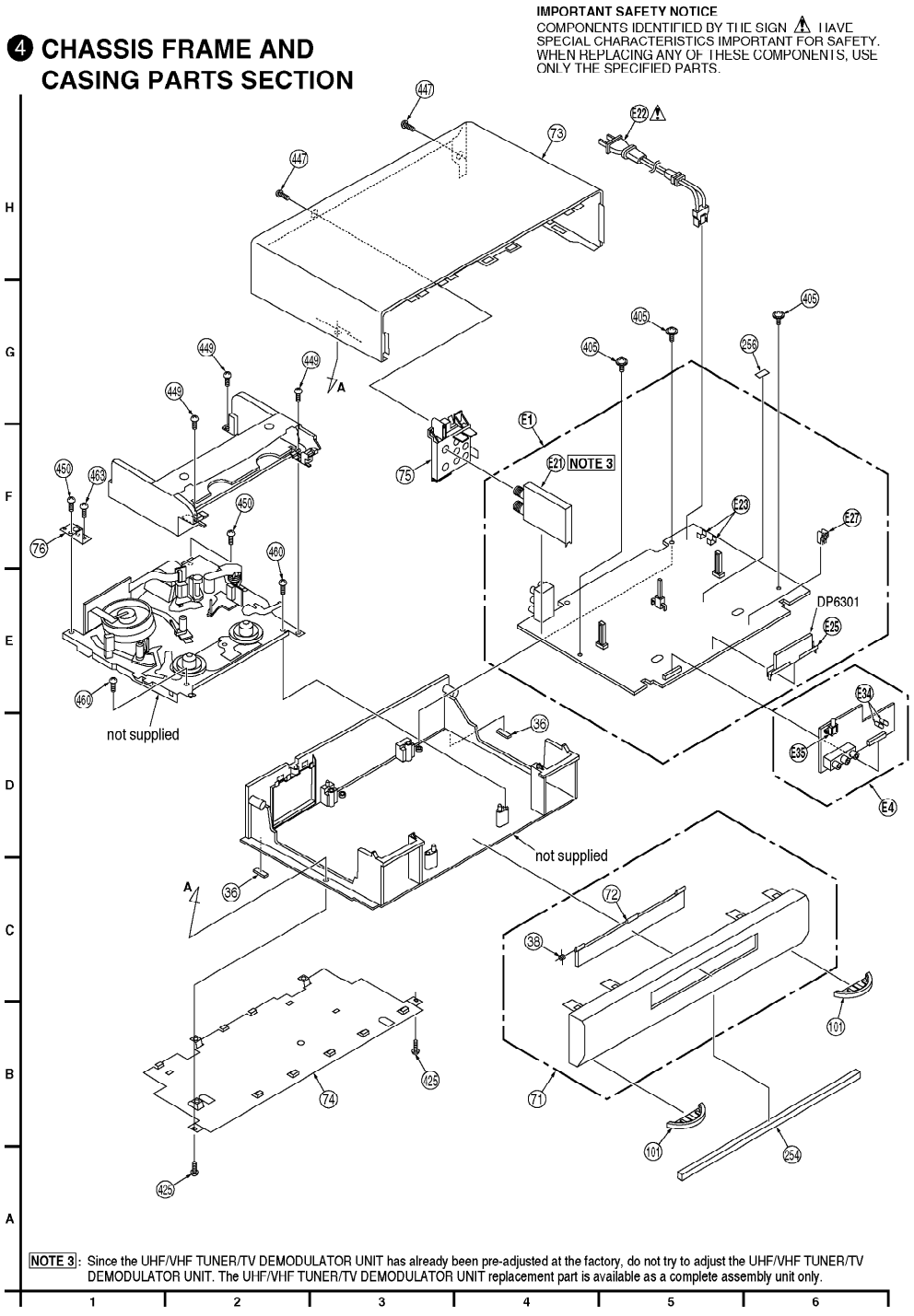
LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
ΛΛΛ	Grease	Available from Factory	VFKS0081

❸ CASSETTE UP COMPARTMENT SECTION

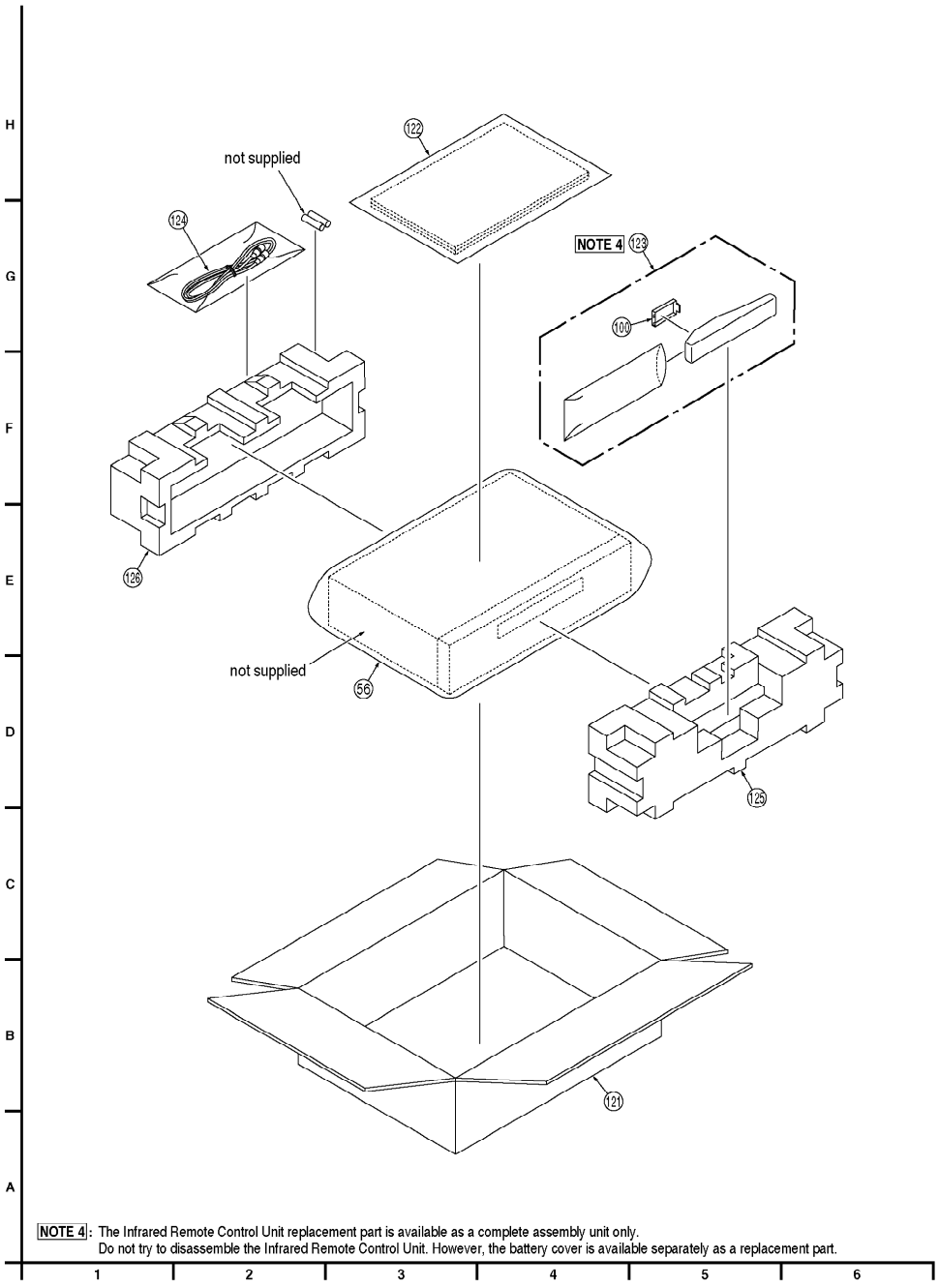


10.4. CHASSIS FRAME AND CASING PARTS SECTION


IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.
❹ CHASSIS FRAME AND CASING PARTS SECTION
NOTE 3
DP6301
not supplied
not supplied
NOTE 3: Since the UHF/VHF TUNER/TV DEMODULATOR UNIT has already been pre-adjusted at the factory, do not try to adjust the UHF/VHF TUNER/TV DEMODULATOR UNIT. The UHF/VHF TUNER/TV DEMODULATOR UNIT replacement part is available as a complete assembly unit only.

10.5. PACKING PARTS AND ACCESSORIES SECTION

❺ PACKING PARTS AND ACCESSORIES SECTION



11. REPLACEMENT PARTS LISTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

11.1. REPLACEMENT NOTES

11.1.1. General Notes

1. Use only original replacement parts:

To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list.

2. **IMPORTANT SAFETY NOTICE**
   Components identified by the sign⚠ have special characteristics important for safety. When replacing any of these components, use only the specified parts.
3. **SPECIAL NOTE**
   All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this servicemanual.
4. **Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.**
5. **Parts different in shape or size may be used. However, only interchangeable parts will be supplied as service replacement parts.**
6. **Parts with mark "MKA" in Remarks column are supplied from MKA. Others are supplied from MKE.**

11.1.2. Mechanical Replacement Notes

1. **Section No. of parts shown in Exploded Views are indicated in the Remarks column.**
2. **Main Cam Gear is supplied as a Main Cam Gear Kit (Ref. No. 8) only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacementpart.**
3. **The Infrared Remote Control Unit (Ref. No. 123) replacement part is available as a complete assembly unit only. Do not try to disassemble the Infrared Remote Control Unit. However, the battery cover is availableseparately as a replacement part.**
4. **Cut Washer (Ref. No. 470) is not reusable.**
   If removed, install a new one.

5. Main Cam Push Nut (Ref. No. 414) is not reusable.
   If removed, install a new one.

11.1.3. Electrical Replacement Notes

1. Item numbers with capital letter E (Example: E1, E2,...) in the Ref. No. column are shown in the exploded views.
2. The parts with " ■ " mark are supplied as an unit, and their individual parts are also supplied separately.
3. Unless otherwise specified;
   All resistors are in Ω , 1/4 W,±5%, carbon, K= 1,000 Ω ,
   M= 1,000 k Ω .
   All capacitors are in μ F, P= μ μ F,±10%.
   All coils are in μ H, M= 1,000 μ H,±10%.
4. Abbreviation
   RTL: Retention Time Limited
   This indicates that the retention time is limited for this item. After the discontinuation of this item in production, it will no longer be available.
   NR: Non Repairable Board Ass'y
   MGF CHIP: Metal Glaze Film Chip
   C CHIP: Ceramic Chip
   COMPLX CMP: Complex Component
   W FLMPRF: Wirewound Flameproof
   C.B.A.: Circuit Board Assembly
   P.C.B.: Printed Circuit Board
   E.S.D.: Electrostatically Sensitive Devices
5. SERVICE OF CHIP PARTS
   When servicing chip parts, please use a soldering iron of less than 30 W. Refer to "IC, TRANSISTOR AND CHIP PART INFORMATION" page.
6. The parts with " ● " are 0 Ω resistor. When replacing, a wire can be substituted for a 0 Ω resistor.
7. Capstan Stator C.B.A. replacement note:
   The following parts on the Capstan Stator C.B.A. (VEMS0333) are not supplied separately. Please order and replace with the circuit

board assembly instead of individual parts.
(Q2501, Q2502, Q2503, Capstan Coil)

8. When installing the IC2501 (AN3846SC) or Capstan Stator C.B.A., be sure to apply Silicon Grease (VFK1301). Refer to "Stopper Angle, Capstan Rotor Unit, OilSeal, Capstan Stator C.B.A., MR Head, and Sub Rotor Unit" of MECHANISM SECTION in DISASSEMBLY/ASSEMBLY PROCEDURES.
9. Since the UHF/VHF TUNER/TV DEMODULATOR UNIT (Ref. No. E21) has already been pre-adjusted at the factory, do not try to adjust the UHF/VHF TUNER/TV DEMODULATOR UNIT. TheUHF/VHF TUNER/TV DEMODULATOR UNIT replacement part is available as a complete assembly unit only.
10. EEPROM IC (IC6005), Main C.B.A. replacement note:
After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.

11.2. MECHANICAL REPLACEMENT PARTS LIST

11.2.1. MECHANISM PARTS ON CHASSIS

Ref. No.	Part No.	Part Name& Description	Remarks
1	VBSS0033	FULL ERASE HEAD	1
2	VXKS0890	MOTOR BLOCK UNIT	1
3	LSDB0045	TENSION ARM BOSS	1
4	VXDS0212	CAPSTAN HOLDER UNIT	1
5	LSMD0209	OPENER PIECE	1
8	VVGS0009	MAIN CAM GEAR KIT	2
9	LSDR0004	S REEL TABLE	1
10	LSDR0005	T REEL TABLE	1
11	VEGS0435	CYLINDER UNIT	1
12	VEHS0583	AUDIO CONTROL/ERASE HEAD UNIT	1
14	LSDG0112	LIFT GEAR	1
16	VXDS0213	LOADING POST BASE-S UNIT	1
17	VXDS0214	LOADING POST BASE-T UNIT	1
18	VXLS1094	PINCH ARM UNIT	1
19	LSDG0110	INTERMEDIATE GEAR A	1
20	VXLS1101	P5 ARM UNIT	1
21	LSML0131	DRIVE RACK ARM	1
22	VXLS1127	TENSION CONTROL ARM UNIT	1
23	LSMX0129	OIL SEAL	1
24	LSMA0434	REGULATOR ANGLE	1
27	VXLS1130	T BRAKE UNIT	1
29	VXLS1129	TENSION ARM UNIT	1
32	VXLS1104	CLEANER ARM UNIT	1
33	VDPS0269	CLEANER ROLLER	1

Ref. No.	Part No.	Part Name& Description	Remarks
36	VKAS0060	RUBBER FOOT	4
38	LSMB0217	CASSETTE DOOR SPRING	4
41	VXPS0389	CENTER CLUTCH UNIT	2
42	VMBS1151	CHANGING GEAR SPRING	2
43	VXDS0218	CHANGING GEAR	2
44	VXLS1126	IDLER ARM UNIT	2
45	VXPS0393	CAPSTAN ROTOR UNIT	2
46	LSMA0387	STOPPER ANGLE	2
47	LSMM0002	MAIN ROD	2
49	VXLS1099	S LOADING ARMUNIT	2
50	VXLS1098	T LOADING ARM UNIT	2
51	VXDS0217	REEL GEAR	2
52	LSDG0111	INTERMEDIATE GEAR B	2
53	LSMA0423	SUPPORT ANGLE	2
54	LSDV0008	CAPSTAN BELT SQUARE,RUBBER 2MM	2
55	VXPS0392	SUB ROTOR UNIT	2
56	VPFS0057	SHEET,POLYETHYLENE	5
57	LSSA0003	GROUNDING PLATE UNIT	1
58	VXLS1105	SS BRAKE ARM UNIT	2
59	LSMB0196	SS BRAKE SPRING	2
61	VXYS1347	CASSETTE UP ASS'Y	3
62	LSMA0352	TOP PLATE	3
64	LSMD0174	SIDE PLATE L	3
65	LSMD0173	SIDE PLATE R	3
66	LSMB0218	SUPPORT SPRING	3
67	LSML0096	OPENER LEVER	3
68	VXLS1111	DRIVE RACK UNIT	3
69	VXAS4423	HOLDER UNIT	3
70	VXLS1110	WIPER ARM UNIT	3
71	VYPS7051	FRONT PANEL ASS'Y	4
72	VYPS7059	CASSETTE DOOR-LID UNIT	4
73	LSKM0339	TOP COVER	4
74	LSKU0012	BOTTOM PLATE	4
75	LSGP0182	REAR PANEL	4
76	LSSC0332	CHASSIS ANGLE	4
100	LSKF0310	BATTERY COVER	5
101	LSKA0011	FOOT	4
121	LSPG0820	PACKING CASE,PAPER	5
122	LSQF0239	FAN BAG	5
123	LSSQ0218	INFRARED REMOTE CONTROL UNIT	5
124	VJAS0212	VHF CONNECTING CABLE W/PLUG	5
125	LSPN0169	FRONT CUSHION,STYROFOAM	5
126	LSPN0152	REAR CUSHION,STYROFOAM	5
254	LSGQ0028	CUSHION,PLASTIC	4
256	TMK76739	SHEET,NYLON+RAYON	4

11.2.2. SCREWS AND WASHERS

Ref. No.	Part No.	Part Name& Description	Remarks
401	VHDS0475	SCREW,STEEL	1
405	VHDS0496	SCREW W/WASHER,STEEL	4
410	VHDS0498	SCREW W/WASHER,STEEL	1
414	VHNS0070	MAIN CAM PUSH NUT,STEEL	2
422	XWGV2D5G	WASHER,NYLON	2
424	XYC26+SF6J	SCREW W/WASHER,STEEL	1
425	XTB3+12A	TAPPING SCREW,STEEL	2
430	XTV26+6FFZJ	TAPPING SCREW,STEEL	1
447	VHDS0310	SCREW,STEEL	4
449	VHDS0493	TAPPING SCREW,STEEL	4
450	VHDS0309	SCREW,STEEL	4
460	XTN4+12A	TAPPING SCREW,STEEL	4
463	VHDS0455	SCREW W/WASHER,STEEL	4
470	LSMX0135	CUT WASHER,NYLON	1
471	XSN26+5	SCREW,STEEL	1
472	XTN26+5FJ	TAPPING SCREW,STEEL	2
473	XYN26+C6	SCREW W/WASHER,STEEL	2
474	LSHD0056	TAPPING SCREW,STEEL	1
475	XTV26+5FJ	TAPPING SCREW,STEEL	2
478	VHDS0495	SCREW W/WASHER,STEEL	1

11.2.3. SERVICE FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name& Description	Remarks
	VFMS0003H6	VHS ALIGNMENT TAPE	
	VFKS0081	GREASE	
	VFK0329	POST ADJUSTMENT DRIVER	
	VFK1301	SILICON GREASE	
	VFK27	HEAD CLEANING STICK	
	VFK0330	H-POSITION ADJUSTMENT DRIVER	

11.3. ELECTRICAL REPLACEMENT PARTS LIST

PRINTED CIRCUIT BOARD ASSEMBLY

Ref. No.	Part No.	Part Name& Description	Remarks
E1	VEPS6063HD	MAIN C.B.A.	■ E.S.D. RTL
E4	VEPS8057C	OPERATION C.B.A.	■ E.S.D. RTL
E126	VEMS0333	CAPSTAN STATOR C.B.A. NR	■
E6	VEPS5032A	Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A.	■ RTL

11.3.1. MAIN C.B.A. ■

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name& Description	Remarks
IC1001	PS2501-1-X	IC, LINEAR ERROR V. DET	⚠
	OR 0N3131-R.KT	IC, LINEAR ERROR V. DET	⚠
	OR 0N3131-S.KT	IC, LINEAR ERROR V. DET	⚠
IC2601	AN3808K	IC, LINEAR CYLINDER MOTOR DRIVE	
IC3001	AN3479FBP-A	IC, LINEAR VIDEO/AUDIO PROCESS	
IC3101	MN3885S	IC, CCD 1H DELAY	E.S.D.
IC3201	MN3890S	IC, CCD 1H DELAY	E.S.D.
IC3801	AN3275SB-E1	IC, LINEAR SYNC DETECTOR	
IC4201	AN3662FBP	IC, LINEAR Hi-Fi AUDIO MTS/SAP PROCESS	
	OR AN3662FBP-V	IC, LINEAR Hi-Fi AUDIO MTS/SAP PROCESS	
IC6001	MN101D02HPS1	IC, 8BIT MICROCONTROLLER	E.S.D.
IC6002	SG-PK01	REEL SENSOR	
IC6003	SG-PK01	REEL SENSOR	
IC6005	KS24C011CS	IC, 1K EEPROM MEMORY	E.S.D.
	OR KS24C011IS	IC, 1K EEPROM MEMORY	E.S.D.
	OR M24C01-MN6	IC, 1K EEPROM MEMORY	E.S.D.
IC6303	MN12510F	IC, LOGIC OTHER INDICATOR PANEL CONTROL	E.S.D.

TRANSISTORS

Ref. No.	Part No.	Part Name& Description	Remarks
Q1001	2SC4130LF608		⚠
	OR 2SC4559LP.KT		⚠
Q1002	2SD2259		
Q1003	2SC4081T106R	CHIP	
	OR 2SD1819A(R,S)	CHIP	
Q1004	2SA1037K146R	CHIP	
	OR 2SB709A(R,S)	CHIP	
Q1005	2SA1576A106R	CHIP	
	OR 2SB1218ARS	CHIP	
Q1051	2SD1581(T)		
	OR 2SD2159(T)		
Q1052	2SC2412K1	CHIP	
	OR 2SD601(R,S)	CHIP	
Q1053	2SD2097TV2R	CHIP	
	OR 2SD235800A	CHIP	
Q1080	2SB1398(P,Q)	CHIP	
Q1081	2SD601(R,S)	CHIP	
Q1082	2SB1398(P,Q)	CHIP	
Q1083	2SD601(R,S)	CHIP	
Q3001	2SA1037K146R	CHIP	
	OR 2SB709A	CHIP	
Q3201	HN1B01F	COMPLX CMP SI NPN CHIP	
	OR IMZ1	COMPLX CMP SI NPN CHIP	
	OR XN4601	COMPLX CMP SI NPN CHIP	
Q3202	2SA1037K146R	CHIP	
	OR 2SB709A	CHIP	
Q3875	2SA1037K146R	CHIP	
	OR 2SB709A	CHIP	
Q4001	2SA1576A106R	CHIP	
	OR 2SB1218ARS	CHIP	
Q4002	2SD1819A(R,S)	CHIP	
Q4003	2SD1819A(R,S)	CHIP	
Q4004	DTA114TU	CHIP	

Ref. No.	Part No.	Part Name& Description	Remarks
	OR UN5115	CHIP	
Q4005	DTC114TU	CHIP	
	OR UN5215	CHIP	
Q4006	DTC114TU	CHIP	
	OR UN5215	CHIP	
Q4007	DTC114TU	CHIP	
	OR UN5215	CHIP	
Q4101	2SC2412K1	CHIP	
	OR 2SD601(R,S)	CHIP	
Q6001	2SC4081T106R	CHIP	
	OR 2SD1819A(R,S)	CHIP	
Q6002	2SB709A(R,S)	CHIP	
Q6003	2SC4081T106R	CHIP	
	OR 2SD1819A(R,S)	CHIP	
Q6005	2SA1037K146R	CHIP	
	OR 2SB709A(R,S)	CHIP	
Q6006	2SC4081T106R	CHIP	
	OR 2SD1819A(R,S)	CHIP	
Q6007	DTA143EU	CHIP	
	OR UN511L	CHIP	
Q6009	VEKS5707	PHOTO SENSOR UNIT	
Q6010	VEKS5707	PHOTO SENSOR UNIT	

DIODES

Ref. No.	Part No.	Part Name& Description	Remarks
D1001	S1WBA60-4062		⚠
D1002	EG01V1		
	OR ERA18-04V3		
	OR RMPG06J6203		
D1003	ERA18-04V3		
D1005	EG01V1		
	OR ERA18-04V3		
	OR RMPG06J6203		
D1006	ERB32-01L3		
	OR ERC30-01L3		
	OR RU2YXLFC1		
	OR RU3YXLFC1		
D1007	MA188	CHIP	
	OR 1SS244T-77		
D1008	EC21QS03L		
	OR SFPJ-63		
D1009	D1FS4		
	OR EC10QS03L		
	OR EP10QY03		
	OR SFPJ-53		
	OR U1FWJ44N		
D1011	MA4051N-TAKT	ZENER 5.1V	
D1012	MA858		
	OR 1SS135T-77		
D1013	MA165		
	OR 1SS119		
	OR 1SS133T		
D1015	MA7180	ZENER 18V	⚠

Ref. No.	Part No.	Part Name& Description	Remarks
D1016	MA165		
	OR 1SS119		
	OR 1SS133T		
D1051	MA4110N-H	ZENER 11	
D1080	EK19V1	(early product)	
D1080	SFPB-69V	CHIP (latest product)	
D1081	MA7240A-TR	ZENER 24V	
D1083	ERA15-01V5		
D1084	ERA15-01V5		
D1085	ERA15-01V5		
D1086	ERA15-01V5		
D1087	ERA15-01V5		
D1088	ERA15-01V5		
D4209	MA165		
	OR 1SS119		
	OR 1SS133T		
D6001	VEKS5708	SENSOR LED UNIT	
D6003	MA165		
	OR 1SS119		
	OR 1SS133T		
D6324	MA4056-M	ZENER 5.6V	
	OR MTZJT-775.6B	ZENER 5.6V	
	OR RD5.6ESAB2	ZENER 5.6V	
D6325	MA165		
	OR 1SS119		
	OR 1SS133T		
D6326	MA165		
	OR 1SS119		
	OR 1SS133T		

RESISTORS

Ref. No.	Part No.	Part Name& Description	Remarks
R1001	VRESC2TK275T	+-10% 1/2W 2.7M	⚠
R1003	VRESE2TJ334	1/2W 330K	
R1004	ERG2SJW333E	METAL OXIDE 2W 33K	
R1005	ERG1SJW560E	METAL OXIDE 1W 56	
R1006	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1007	ERDS2TJ101	100	
R1008	ERDS2TJ392	3.9K	
R1010	ERD25FYJ100T	10	⚠
	OR VRESS4FJ100E	10	⚠
R1011	ERD25FYJ100T	10	⚠
	OR VRESS4FJ100E	10	⚠
R1014	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1015	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1016	ERJ8GEYJ562V	MGF CHIP 1/8W 5.6K	
R1017	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R1018	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R1019	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R1020	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R1022	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1024	ERD2FCVG330T	+-2% 33	⚠
R1025	VRESE2TJ150	1/2W 15	

Ref. No.	Part No.	Part Name& Description	Remarks
R1051	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R1052	ERDS2TJ153	15K	
R1053	ERDS2TJ153	15K	
R1057	ERDS2TJ331	330	
R1058	ERDS2TJ104	100K	
R1068	ERDS2T0	0	●
R1080	ERDS2TJ103	10K	
R1081	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R1083	VRESE2TJ122	1/2W 1.2K	
R1084	VRESE2TJ122	1/2W 1.2K	
R1085	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1086	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R2601	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2602	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2603	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2604	ERDS2TJ1R0	1	
R2605	ERDS2TJ1R2	1.2	
R2606	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3003	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3004	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3008	ERDS2TJ561	560	
R3022	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3023	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3027	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3029	ERJ6GEYJ125V	MGF CHIP 1/10W 1.2M	
R3031	ERJ6GEYJ474V	MGF CHIP 1/10W 470K	
R3033	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3034	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3035	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R3036	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3041	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3051	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3052	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3202	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R3204	EVMF6SA00B23	VARIABLE 2K	
R3205	EVNGBAA01B13	VARIABLE 1K	
R3206	ERJ6GEYJ271V	MGF CHIP 1/10W 270	
R3207	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R3208	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R3209	ERJ6GEYJ271V	MGF CHIP 1/10W 270	
R3210	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3211	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3212	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R3213	ERJ6GEY0R00V	MGF CHIP 1/10W 0	●
R3214	ERJ6GEYJ273V	MGF CHIP 1/10W 27K	
R3301	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3302	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3305	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3803	ERJ6GEYG473V	MGF CHIP+-2% 1/10W 47K	
R3807	ERJ6GEYJ393V	MGF CHIP 1/10W 39K	
R3810	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R3811	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	

Ref. No.	Part No.	Part Name& Description	Remarks
R3874	ERJ6GEYJ471V	MGF CHIP 1/10W 470	
R3875	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4001	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4002	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R4003	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R4004	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4005	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R4006	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R4007	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R4008	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R4010	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4011	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4012	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4014	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R4016	ERJ6GEY0R00V	MGF CHIP 1/10W 0	●
R4017	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4027	ERJ6GEY0R00V	MGF CHIP 1/10W 0	●
R4028	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R4101	ERJ6GEYJ224V	MGF CHIP 1/10W 220K	
R4102	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4103	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R4201	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4202	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4203	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4204	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4206	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4207	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4208	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4209	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4210	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4213	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4214	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4218	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R4219	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R4221	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4222	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4223	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4224	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4225	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4226	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4228	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4453	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4455	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4901	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6001	ERDS2TJ101	100	
R6003	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6007	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6010	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6012	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6014	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	

Ref. No.	Part No.	Part Name& Description	Remarks
R6015	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6016	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6019	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6022	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R6024	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6025	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R6026	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6027	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R6028	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6029	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R6030	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6033	ERDS2TJ681	680	
R6035	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6036	ERJ6GEYJ563V	MGF CHIP 1/10W 56K	
R6037	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R6038	ERDS2TJ560	56	
R6039	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6049	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6051	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6052	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6054	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6057	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6059	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6060	ERJ6GEYJ475V	MGF CHIP 1/10W 4.7M	
R6062	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6063	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6064	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6065	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6066	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6068	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6069	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6070	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6071	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6072	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6073	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6074	ERDS2TJ272	2.7K	
R6076	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6077	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6078	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6079	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6080	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6081	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6085	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6086	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6087	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6088	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6089	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6090	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6093	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6100	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6109	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6110	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6114	ERJ6GEYJ221V	MGF CHIP 1/10W 220	

Ref. No.	Part No.	Part Name& Description	Remarks
R6115	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6116	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6202	ERJ6GEYJ274V	MGF CHIP 1/10W 270K	
R6203	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6204	ERJ6GEYJ184V	MGF CHIP 1/10W 180K	
R6205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6224	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6228	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R6230	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6231	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R6301	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6302	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6303	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6304	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6305	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6306	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6307	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6308	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6309	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6310	ERJ6GEYJ683V	MGF CHIP 1/10W 68K	
R6311	ERDS2TJ270	27	
R6312	ERDS2TJ270	27	
R6346	ERDS2TJ470	47	
R6353	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6361	ERJ8GEYJ4R7V	MGF CHIP 1/8W 4.7	
R6364	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6365	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6366	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6367	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6368	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6369	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R7002	ERJ6GEYJ271V	MGF CHIP 1/10W 270	
R7004	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R7006	ERJ6GEYJ112V	MGF CHIP 1/10W 1.1K	

CAPACITORS

Ref. No.	Part No.	Part Name& Description	Remarks
C1001	ECKNTS103MF8	CERAMIC+-20% 250V 0.01	⚠
	OR VCKSTQG103ZY	CERAMIC+80%-20% 125V 0.01	⚠
	OR VCKSUQD103MY	CERAMIC+-20% 125V 0.01	⚠
C1002	ECKNNB332ME8	CERAMIC+-20% 125V 3300P	⚠
	OR ECKNTS332ME8	CERAMIC+-20% 250V 3300P	⚠
	OR VCKSTQG332MX	CERAMIC+-20% 125V 3300P	⚠
	OR VCKSUQD332MX	CERAMIC+-20% 125V 3300P	⚠
C1003	ECKNNB332ME8	CERAMIC+-20% 125V 3300P	⚠
	OR ECKNTS332ME8	CERAMIC+-20% 250V 3300P	⚠
	OR VCKSTQG332MX	CERAMIC+-20% 125V 3300P	⚠
	OR VCKSUQD332MX	CERAMIC+-20% 125V 3300P	⚠
C1004	ECEA2DU121YB	ELECTROLYTIC 200V 120	⚠
	OR VCESAN2D121B	ELECTROLYTIC 200V 120	⚠
	OR VCESR2D121XB	ELECTROLYTIC 200V 120	⚠
C1005	ECA2DHG4R7B	ELECTROLYTIC 200V 4.7	
C1006	ECKW2H221KB5	CERAMIC 500V 220P	
C1007	VCUSQAH224KB	C CHIP 50V 0.22	
C1009	VCYSBRE183KX	CERAMIC 25V 0.018	
C1010	ECUV1H101JCN	C CHIP+-5% 50V 100P (early product)	
C1010	VCYSARH101KB	C CHIP 50V 100P (latest product)	
C1011	ECA1HHG4R7I	ELECTROLYTIC 50V 4.7V	
C1012	ECEA1PEE331	ELECTROLYTIC 18V 330	
C1013	ECA1EM331B	ELECTROLYTIC 25V 330	
C1014	ECA1HHG4R7I	ELECTROLYTIC 50V 4.7V	
C1016	ECEA1PEE331	ELECTROLYTIC 18V 330	
C1017	ECA0JM102B	ELECTROLYTIC 6.3V 1000	
C1018	ECUV1C104KBN	C CHIP 16V 0.1	
C1019	ECEA0JEE101	ELECTROLYTIC 6.3V 100	
C1021	EEUGA1H1R0H	ELECTROLYTIC 50V 1	
C1023	ECUV1E104KBN	C CHIP 25V 0.1	
C1025	ECKNRS101MBY	CERAMIC+-20% 125V 100P	⚠
	OR ECKNTS101MB	CERAMIC+-20% 250V 100	⚠
	OR VCKSTNG101KW	CERAMIC 125V 100P	⚠
	OR VCKSUND101KW	CERAMIC 125V 100P	⚠
C1027	ECKNTS103MF8	CERAMIC+-20% 250V 0.01	⚠
	OR VCKSTQG103ZY	CERAMIC+80%-20% 125V 0.01	⚠
	OR VCKSUQD103MY	CERAMIC+-20% 125V 0.01	⚠
C1029	ECUV1H101JCN	C CHIP+-5% 50V 100P	
C1030	VCYSBRE183KX	CERAMIC 25V 0.018	
C1032	ECEA0JKA221	ELECTROLYTIC 6.3V 220	
C1051	ECEA1HKAR47	ELECTROLYTIC 50V 0.47	
C1052	ECEA1CKA100	ELECTROLYTIC 16V 10	
C1058	ECEA0JEE101	ELECTROLYTIC 6.3V 100	
C1059	ECEA1CKA470	ELECTROLYTIC 16V 47	
C1080	EEUFD1V331LB	ELECTROLYTIC 35V 330	
C2601	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7	
C2602	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7	
C2603	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7	
C2604	ECUV1C104KBN	C CHIP 16V 0.1	
C2605	ECUV1C104KBN	C CHIP 16V 0.1	
C2606	ECUV1C104KBN	C CHIP 16V 0.1	

Ref. No.	Part No.	Part Name& Description	Remarks
C2607	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C2608	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C2609	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C2610	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C2611	ECUV1H103KBN	C CHIP 50V 0.01	
C2612	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3001	ECA0JM471	ELECTROLYTIC 6.3V 470	
C3014	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3015	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3017	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7	
C3018	ECUV1H181JCN	C CHIP+-5% 50V 180P	
C3019	ECUV1H560JCN	C CHIP+-5% 50V 56P	
C3021	ECUV1C224ZFV	C CHIP+80%-20% 16V 0.22	
C3022	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3023	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C3024	ECEA0JKA470	ELECTROLYTIC 6.3V 47	
C3025	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3026	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3027	ECUV1C224ZFV	C CHIP+80%-20% 16V 0.22	
C3028	ECEA1CKA100	ELECTROLYTIC 16V 10	
C3029	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3030	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C3031	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2	
C3032	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2	
C3033	ECEA0JKA470	ELECTROLYTIC 6.3V 47	
C3034	ECUV1C224ZFV	C CHIP+80%-20% 16V 0.22	
C3035	ECUV1H560JCN	C CHIP+-5% 50V 56P	
C3036	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3037	ECEA0JKA220	ELECTROLYTIC 6.3V 22	
C3038	ECEA1HKS2R2	ELECTROLYTIC 50V 2.2	
C3039	ECUV1H822KBN	C CHIP 50V 8200P	
C3043	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3044	ECUV1C474ZFV	C CHIP+80%-20% 16V 0.47	
C3045	ECUV1C474ZFV	C CHIP+80%-20% 16V 0.47	
C3047	ECUV1H181JCN	C CHIP+-5% 50V 180P	
C3048	ECUV1H560JCN	C CHIP+-5% 50V 56P	
C3049	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3050	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3051	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C3052	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3053	ECUV1C474ZFV	C CHIP+80%-20% 16V 0.47	
C3054	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2	
C3055	ECUV1H392KBN	C CHIP 50V 3900P	
C3056	ECUV1A105ZFV	C CHIP+80%-20% 10V 1	
C3057	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3058	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C3059	ECUV1H020CCN	C CHIP+-0.25P 50V 2P	
C3062	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3101	ECUV1A105ZFV	C CHIP+80%-20% 10V 1	
C3102	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3104	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3105	ECUV1H103ZFN	CCHIP+80%-20% 50V 0.01	
C3106	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3108	ECUV1H102KBN	C CHIP 50V 1000P	

Ref. No.	Part No.	Part Name& Description	Remarks
C3109	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C3201	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3202	ECEA0JKS470	ELECTROLYTIC 6.3V 47	
C3203	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3204	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3205	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3206	ECUV1H102KBN	C CHIP 50V 1000P	
C3207	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3208	ECUV1H472KBN	C CHIP 50V 4700P	
C3210	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3211	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3213	ECUV1H121JCN	C CHIP+-5% 50V 120P	
C3214	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3215	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3216	ECUV1H180JCN	C CHIP+-5% 50V 18P	
C3217	ECUV1H101JCN	C CHIP+-5% 50V 100P	
C3218	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3302	ECUV1A105ZFV	C CHIP+80%-20% 10V 1	
C3303	ECUV1H121JCN	C CHIP+-5% 50V 120P	
C3306	ECEA1HKAR47	ELECTROLYTIC 50V 0.47	
C3308	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3801	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C3802	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3803	ECUV1H332KBN	C CHIP 50V 3300P	
C3804	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3805	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3806	ECUV1H392KBN	C CHIP 50V 3900P	
C3807	ECUV1H103KBN	C CHIP 50V 0.01	
C3808	ECUV1E104KBN	C CHIP 25V 0.1	
C3811	ECUV1H103KBN	C CHIP 50V 0.01	
C3812	ECUV1H102KBN	C CHIP 50V 1000P	
C3815	ECUV1E104KBN	C CHIP 25V 0.1	
C3816	VCUSTBC224JB	C CHIP+-5% 16V 0.22	
C3817	ECUV1H103KBN	C CHIP 50V 0.01	
C3818	ECUV1H103KBN	C CHIP 50V 0.01	
C3819	ECUV1H103KBN	C CHIP 50V 0.01	
C3820	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3821	ECUV1H390JCN	C CHIP+-5% 50V 39P	
C3822	ECEA1HKA010	ELECTROLYTIC 50V 1	
C3825	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2	
C3826	ECUV1C474ZFN	C CHIP+80%-20% 16V 0.47	
C3828	ECUV1H101JCN	C CHIP+-5% 50V 100P	
C3829	ECUV1H101JCN	C CHIP+-5% 50V 100P	
C4001	ECUV1C224ZFV	C CHIP+80%-20% 16V 0.22	
C4002	ECEA1HKA010	ELECTROLYTIC 50V 1	
C4003	ECUV1H272KBN	C CHIP 50V 2700P	
C4004	ECUV1H103KBN	C CHIP 50V 0.01	
C4005	ECEA0JKA220	ELECTROLYTIC 6.3V 22	
C4006	ECUV1H102KBN	C CHIP 50V 1000P	
C4007	ECEA0JKA220	ELECTROLYTIC 6.3V 22	
C4008	ECEA0JKA470	ELECTROLYTIC 6.3V 47	
C4009	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4010	ECUV1E273KBN	C CHIP 25V 0.027	
C4011	ECUV1H822KBN	C CHIP 50V 8200P	

Ref. No.	Part No.	Part Name& Description	Remarks
C4012	ECEA1HKA010	ELECTROLYTIC 50V 1	
C4014	ECEA1HKA010	ELECTROLYTIC 50V 1	
C4015	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C4017	ECUV1H103KBN	C CHIP 50V 0.01	
C4102	ECQB1562JF	POLYESTER+-5% 100V 5600P	
C4103	ECUV1H103KBN	C CHIP 50V 0.01	
C4104	ECUV1H103KBN	C CHIP 50V 0.01	
C4106	ECEA1CKA220	ELECTROLYTIC 16V 22	
C4201	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7	
C4202	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7	
C4203	ECEA0JKA330	ELECTROLYTIC 6.3V 33	
C4204	ECEA0JKA330	ELECTROLYTIC 6.3V 33	
C4205	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4206	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4207	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4208	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4209	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4210	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4211	ECUV1H153KBN	C CHIP 50V 0.015	
C4212	ECUV1H153KBN	C CHIP 50V 0.015	
C4213	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4216	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4217	ECEA0JKA220	ELECTROLYTIC 6.3V 22	
C4218	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4219	ECEA1HKA010	ELECTROLYTIC 50V 1	
C4227	ECUV1C224ZFV	C CHIP+80%-20% 16V 0.22	
C4228	ECUV1H103KBN	C CHIP 50V 0.01	
C4229	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C4230	ECEA0JKA470	ELECTROLYTIC 6.3V 47	
C4451	ECUV1H103KBN	C CHIP 50V 0.01	
C4452	ECUV1H103KBN	C CHIP 50V 0.01	
C4455	ECUV1C104KBN	C CHIP 16V 0.1	
C4456	ECUV1C104KBN	C CHIP 16V 0.1	
C4459	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C4901	ECEA1HKA010	ELECTROLYTIC 50V 1	
C4902	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2	
C4903	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3	
C4904	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3	
C4905	ECEA1CKA100	ELECTROLYTIC 16V 10	
C4906	ECEA1HKA010	ELECTROLYTIC 50V 1	
C4911	ECUV1E223KBN	C CHIP 25V 0.022	
C4912	ECUV1C104KBN	C CHIP 16V 0.1	
C4913	ECUV1H103KBN	C CHIP 50V 0.01	
C4917	ECUV1C104KBN	C CHIP 16V 0.1	
C4918	ECUV1C104KBN	C CHIP 16V 0.1	
C4919	ECUV1C104KBN	C CHIP 16V 0.1	
C4920	ECUV1C104KBN	C CHIP 16V 0.1	
C6001	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C6003	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C6005	ECUV1H150JCN	C CHIP+-5% 50V 15P	
C6006	ECUV1H100CCN	C CHIP+-0.25P 50V 10P	
C6011	ECUV1H101JCN	C CHIP+-5% 50V 100P	
C6016	ECEA0JKA331	ELECTROLYTIC 6.3V 330	
C6019	ECEA0JKA101	ELECTROLYTIC 6.3V 100	

Ref. No.	Part No.	Part Name& Description	Remarks
C6024	ECUV1H101JCN	C CHIP+-5% 50V 100P	
C6026	ECUV1H102KBN	C CHIP 50V 1000P	
C6027	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C6033	ECUV1H104ZFN	C CHIP+80%-20% 50V 0.1	
C6201	ECUV1H102KBN	C CHIP 50V 1000P	
C6203	ECUV1H103KBN	C CHIP 50V 0.01	
C6208	ECUV1C104KBN	C CHIP 16V 0.1	
C6214	ECUV1H102KBN	C CHIP 50V 1000P	
C6216	ECUV1H103KBN	C CHIP 50V 0.01	
C6217	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C6218	ECEA1CKA100	ELECTROLYTIC 16V 10	
C6221	ECEA0JKA220	ELECTROLYTIC 6.3V 22	
C6222	ECUV1H272KBN	C CHIP 50V 2700P	
C6223	ECUV1H102KBN	C CHIP 50V 1000P	
C6224	ECEA0JKA331	ELECTROLYTIC 6.3V 330	
C6228	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C6231	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C6305	ECEA0JKA470	ELECTROLYTIC 6.3V 47	
C6306	ECA0JM471	ELECTROLYTIC 6.3V 470	
C6307	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C6315	ECA1HM101B	ELECTROLYTIC 50V 100	
C7001	ECEA0JKA101	ELECTROLYTIC 6.3V 100	
C7010	ECUV1H102KBN	C CHIP 50V 1000P	

FILTERS

Ref. No.	Part No.	Part Name& Description	Remarks
FL4901	LSLF0057	BAND PASS	

COILS

Ref. No.	Part No.	Part Name& Description	Remarks
L1001	ELF15N005AB	LINE FILTER 0.5A 18M	⚠
	OR VLQS0166	LINE FILTER 0.5A 18M	⚠
	OR VLQS0167	LINE FILTER 0.5A 18M	⚠
L1002	VLQSAB7D220K	22	
L1003	VLQSAB7D100K	10	
L1006	VLPS0083		
L3014	VLQSH02R390K	39	
L3016	ELESN330KA	33	
L3018	ELESN470KA	47	
L3101	ELESN101KA	100	
L3201	ELESN101KA	100	
L3202	ELESN121KA	120	
L3203	ELEXT220KE04	22	
L3801	ELESN101KA	100	
L3802	ELESN470KA	47	
L4001	ELELN153KA	15M	
L4101	ELESN471KA	470	
L4201	ELESN101KA	100	
L4451	ELESN101KA	100	
L6002	ELEXT101KE04	100	
L6301	ELESN101KA	100	
L7001	VLQSAB7D220K	22	
Ref. No.	Part No.	Part Name& Description	Remarks
L7003	VLQSH02R101K	100	
L7005	VLPS0092	CHIP	

CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name& Description	Remarks
X3010	VSXS0195		
X6001	VSXS0232-TB		
X6301	EF0EC4004T4		

PIN HEADERS

Ref. No.	Part No.	Part Name& Description	Remarks
P1001	LSJP0807	CONNECTOR 2P	
P3551	VJPS0882	CONNECTOR 12P	
P4001	VJSS0888	FE CONNECTOR 2P	
P4451	LSJP0087	CONNECTOR 4P	
P6201	LSJP0089	CONNECTOR 12P	
P6202	LSJP0088	CONNECTOR 12P	
P6320	VJPS0885	CONNECTOR 20P	

SWITCHES

Ref. No.	Part No.	Part Name& Description	Remarks
SW6001	LSSH0002	LEAF SWITCH-SAFETY TAB	
SW6002	LSSS0012	MODE SELECT SWITCH	
SW6306	EVQ11A09K	PUSH SWITCH	
SW6310	EVQ11A09K	PUSH SWITCH	
SW6313	EVQ11A09K	PUSH SWITCH	
SW6314	EVQ11A09K	PUSH SWITCH	
SW6316	EVQ11A09K	PUSH SWITCH	

FUSE& PROTECTOR

Ref. No.	Part No.	Part Name& Description	Remarks
F1001	VSFS0003A16	FUSE 125V 1.6A	⚠
	OR VSFS0032B16	FUSE 125V 1.6A	⚠
	OR XBA1C16NU100	FUSE 125V 1.6A	⚠
PR1001	ICP-N38-TP1	IC PROTECTOR 1.5A	⚠
	OR LSSF009A25E	IC PROTECTOR 1.5A	⚠
	OR UNH000600A	IC PROTECTOR 1.5A	⚠
PR1002	ICP-N38-TP1	IC PROTECTOR 1.5A	⚠
	OR LSSF009A25E	IC PROTECTOR 1.5A	⚠
	OR UNH000600A	IC PROTECTOR 1.5A	⚠
PR1080	ICP-N38-TP1	IC PROTECTOR 1.5A	⚠
	OR LSSF009A25E	IC PROTECTOR 1.5A	⚠
	OR UNH000600A	IC PROTECTOR 1.5A	⚠

TRANSFORMER

Ref. No.	Part No.	Part Name& Description	Remarks
T1001	LSTP0098		⚠
T4101	EIQ7QF018Q		

MISCELLANEOUS

Ref. No.	Part No.	Part Name& Description	Remarks
DP6301	VSZS0131	DISPLAY TUBE	
JK3001	LSJH0029	AUDIO/VIDEO JACK SOCKET	
E21	VEQS0614H	TUNER,UHF/VHF NR	
E23	EYF52BC	FUSE HOLDER	
E25	LSGM0002	DISPLAY TUBE HOLDER	
E27	PNA4611M03KT	INFRARED RECEIVER UNIT	

11.3.2. OPERATION C.B.A. ■

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name& Description	Remarks
IC6401	D17216GT-750	IC, 4BIT MICROCONTROLLER	E.S.D.
IC6403	MN13821-RTX	IC, LOGIC RESET SIGNAL OUT	E.S.D.

TRANSISTORS

Ref. No.	Part No.	Part Name& Description	Remarks
Q6401	2SD2191TL2		

DIODES

Ref. No.	Part No.	Part Name& Description	Remarks
D6401	LN66ALKT	IR LED	
D6402	LN66ALKT	IR LED	
D6403	LN66ALKT	IR LED	
D7801	MA4051-M	ZENER 5.1V	
	OR 04AZ5.1ZTPA7	ZENER 5.1V	
D7802	MA4051-M	ZENER 5.1V	
	OR 04AZ5.1ZTPA7	ZENER 5.1V	

RESISTORS

Ref. No.	Part No.	Part Name& Description	Remarks
R6401	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6402	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6403	ERDS2TJ220	22	
R6404	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6405	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R7801	ERDS2TJ750	75	

CAPACITORS

Ref. No.	Part No.	Part Name& Description	Remarks
C6401	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C6402	ECEA0JKA470	ELECTROLYTIC 6.3V 47	
C6403	ECUV1H104ZFN	C CHIP+80%-20% 50V 0.1	

CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name& Description	Remarks
X6401	EF0EC4004T4		

PIN HEADERS

Ref. No.	Part No.	Part Name& Description	Remarks
P6302	VJSS0886	CONNECTOR 20P	

SWITCHES

Ref. No.	Part No.	Part Name& Description	Remarks
SW6301	EVQ11G05R	PUSH SWITCH	
SW6302	EVQ11G05R	PUSH SWITCH	
SW6303	EVQ11G05R	PUSH SWITCH	
SW6304	EVQ11G05R	PUSH SWITCH	

JACKS

Ref. No.	Part No.	Part Name& Description	Remarks
JK7801	VJHS0736	FRONT AUDIO/VIDEO JACK SOCKET	

MISCELLANEOUS

Ref. No.	Part No.	Part Name& Description	Remarks
E34	VMXS0575	LED SPACER	
E35	VGMS0611	LED HOLDER	

11.3.3. CAPSTAN STATOR C.B.A. NR ■

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name& Description	Remarks
IC2501	AN3846SC	IC, LINEAR CAP./LOADING DRIVE	

RESISTORS

Ref. No.	Part No.	Part Name& Description	Remarks
R2501	ERJ14YJ1R0U	MGF CHIP 1	
R2502	ERJ14YJ1R0U	MGF CHIP 1	
R2505	ERJ6GEYJ242V	MGF CHIP 1/10W 2.4K	

CAPACITORS

Ref. No.	Part No.	Part Name& Description	Remarks
C2504	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C2506	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C2507	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C2508	ECUV1E104KBN	C CHIP 25V 0.1	
C2509	ECUV1E104KBN	C CHIP 25V 0.1	
C2510	ECUV1E104KBN	C CHIP 25V 0.1	
C2511	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C2517	VCUSQAE225ZF	C CHIP+80%-20% 25V 2.2	
C2519	ECUV1H102KBN	C CHIP 50V 1000P	
C2520	VCUSQAE225ZF	C CHIP+80%-20% 25V 2.2	
C2521	VCUSQAE225ZF	C CHIP+80%-20% 25V 2.2	
C2522	VCUSQAE225ZF	C CHIP+80%-20% 25V 2.2	

PIN HEADERS

Ref. No.	Part No.	PartName& Description	Remarks
P2503	VJSS3337	CONNECTOR 2P	

MISCELLANEOUS

Ref. No.	Part No.	Part Name& Description	Remarks
E127	XQN2+B35	SCREW,STEEL	
E128	XYN2+J7	SCREW W/WASHER,STEEL	
E129	LSMA0385	BACK PLATE,STEEL	
E130(IC2505)	EZMPS300F12	MR HEAD	
E131(P2502)	LSJS0097	CONNECOR 12P	

11.3.4. Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A. ■

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name& Description	Remarks
IC3501	AN3361SB	IC, LINEAR HEAD AMP	

RESISTORS

Ref. No.	Part No.	Part Name& Description	Remarks
R3501	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R3502	ERJ6GEYJ560V	MGF CHIP 1/10W 56	
R3503	ERJ6GEYJ560V	MGF CHIP 1/10W 56	
R3504	ERJ6GEYJ560V	MGF CHIP 1/10W 56	
R3505	ERJ6GEYJ560V	MGF CHIP 1/10W 56	
R3506	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3507	ERJ6GEYJ561V	MGF CHIP 1/10W 560	

CAPACITORS

Ref. No.	Part No.	Part Name& Description	Remarks
C3504	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3505	ECEA1CKA470	ELECTROLYTIC 16V 47	
C3506	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3507	ECUV1H102KBN	C CHIP 50V 1000P	
C3508	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3511	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3512	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3513	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3519	ECUV1H104ZFN	C CHIP+80%-20% 50V 0.1	
C3520	ECUV1H104ZFN	C CHIP+80%-20% 50V 0.1	
C3523	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3524	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3528	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3529	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	
C3532	ECUV1E104ZFN	C CHIP+80%-20% 25V 0.1	
C3533	ECUV1H103ZFN	C CHIP+80%-20% 50V 0.01	

COILS

Ref. No.	Part No.	Part Name& Description	Remarks
L3501	ELESN101KA	100	

PIN HEADERS

Ref. No.	Part No.	Part Name& Description	Remarks
P2601	LSJS0096	CONNECTOR 12P	
P3501	VJSS0883	CONNECTOR 12P	
P4091	LSJWM6N085AC	CONNECTOR CABLE W/OUT PLUG,40VP-P	
P4401	LSJS0095	CONNECTOR 4P	

11.3.5. ELECTRICAL PARTS LOCATED ON CHASSIS

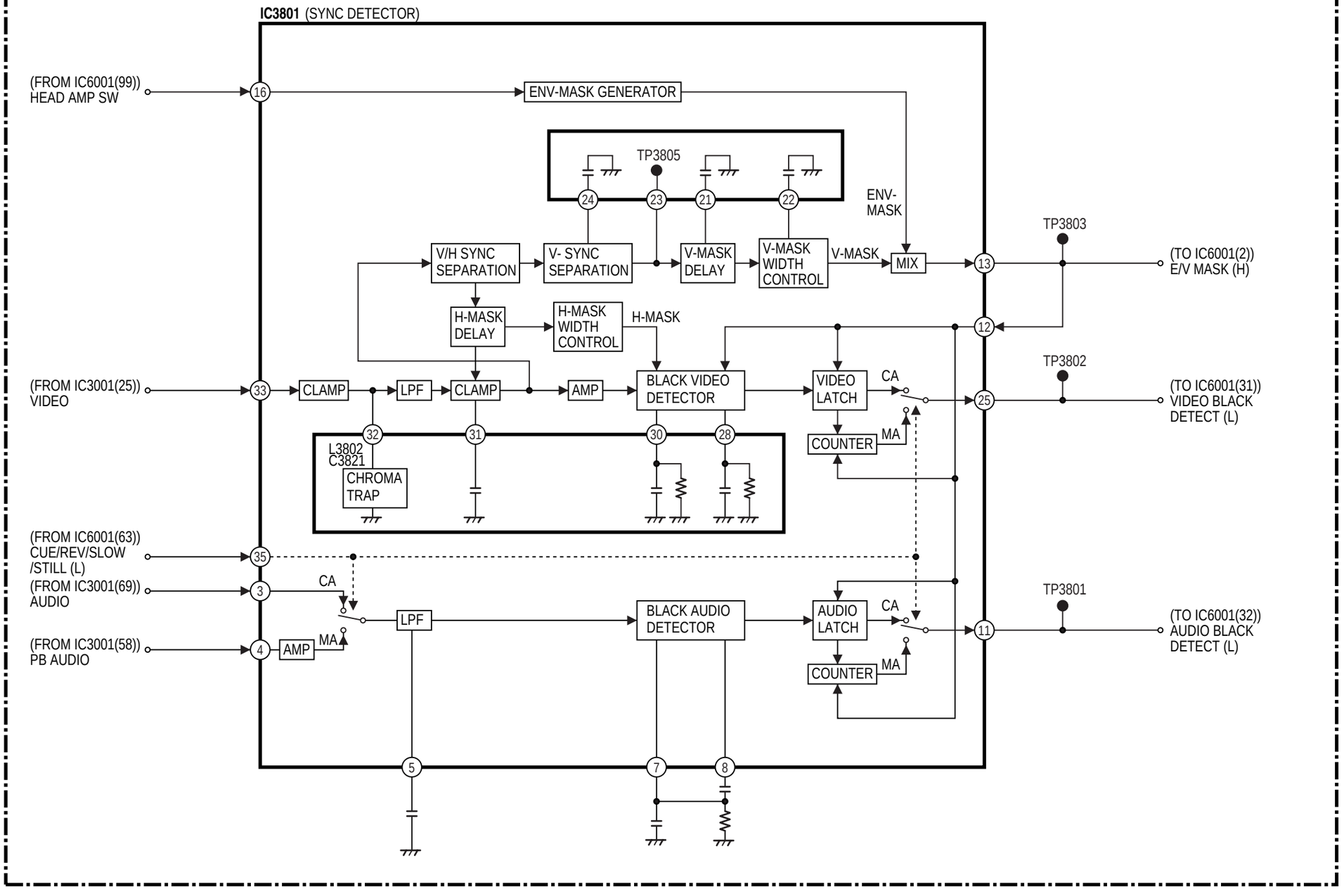
Ref. No.	Part No.	Part Name& Description	Remarks
E22	LSJA0267	AC CORD W/PLUG,125V	⚠
	OR LSJA0268	AC CORD W/PLUG,125V	⚠
	OR LSJA0269	AC CORD W/PLUG,125V	⚠
	OR LSJA0270	AC CORD W/PLUG,125V	⚠
	OR LSJA0281	AC CORD W/PLUG,125V	⚠

11.3.6. SUMMARY OF "E" ITEM NUMBERS

REFER TO ELECTRICAL PARTS LIST FOR MODEL INFORMATION

Ref. No.	Part No.	Part Name& Description	Remarks
E1	VEPS6063HD	MAIN C.B.A.	RTL
E4	VEPS8057C	OPERATION C.B.A.	RTL
E6	VEPS5032A	Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A.	RTL
E21	VEQS0614H	TUNER,UHF/VHF NR	
E22	LSJA0267	AC CORD W/PLUG,125V	⚠
E22	LSJA0268	AC CORD W/PLUG,125V	⚠
E22	LSJA0269	AC CORD W/PLUG,125V	⚠
E22	LSJA0270	AC CORD W/PLUG,125V	⚠
E22	LSJA0281	AC CORD W/PLUG,125V	⚠
E23	EYF52BC	FUSE HOLDER	
E25	LSGM0002	DISPLAY TUBE HOLDER	
E27	PNA4611M03KT	INFRARED RECEIVER UNIT	
E34	VMXS0575	LED SPACER	
E35	VGMS0611	LED HOLDER	
E126	VEMS0333	CAPSTAN STATOR C.B.A. NR	
E127	XQN2+B35	SCREW,STEEL	
E128	XYN2+J7	SCREW W/WASHER,STEEL	
E129	LSMA0385	BACK PLATE,STEEL	
E130(IC2505)	EZMPS300F12	MR HEAD	
E131(P2502)	LSJS0097	CONNECOR 12P	

MAIN C.B.A.


IC3801 (SYNC DETECTOR)
(FROM IC6001(99))
HEAD AMP SW
16
ENV-MASK GENERATOR
TP3805
24
23
21
22
ENV-
MASK
TP3803
V/H SYNC
SEPARATION
V- SYNC
SEPARATION
V-MASK
DELAY
V-MASK
WIDTH
CONTROL
V-MASK
MIX
13
(TO IC6001(2))
E/V MASK (H)
H-MASK
DELAY
H-MASK
WIDTH
CONTROL
H-MASK
12
TP3802
(FROM IC3001(25))
VIDEO
33
CLAMP
LPF
CLAMP
AMP
BLACK VIDEO
DETECTOR
VIDEO
LATCH
CA
25
(TO IC6001(31))
VIDEO BLACK
DETECT (L)
32
31
30
28
L3802
C3821
CHROMA
TRAP
COUNTER
MA
(FROM IC6001(63))
CUE/REV/SLOW
/STILL (L)
35
(FROM IC3001(69))
AUDIO
3
CA
TP3801
LPF
BLACK AUDIO
DETECTOR
AUDIO
LATCH
CA
(FROM IC3001(58))
PB AUDIO
4
AMP
MA
11
(TO IC6001(32))
AUDIO BLACK
DETECT (L)
COUNTER
MA
5
7
8

MAIN C.B.A. VEPS6063HD

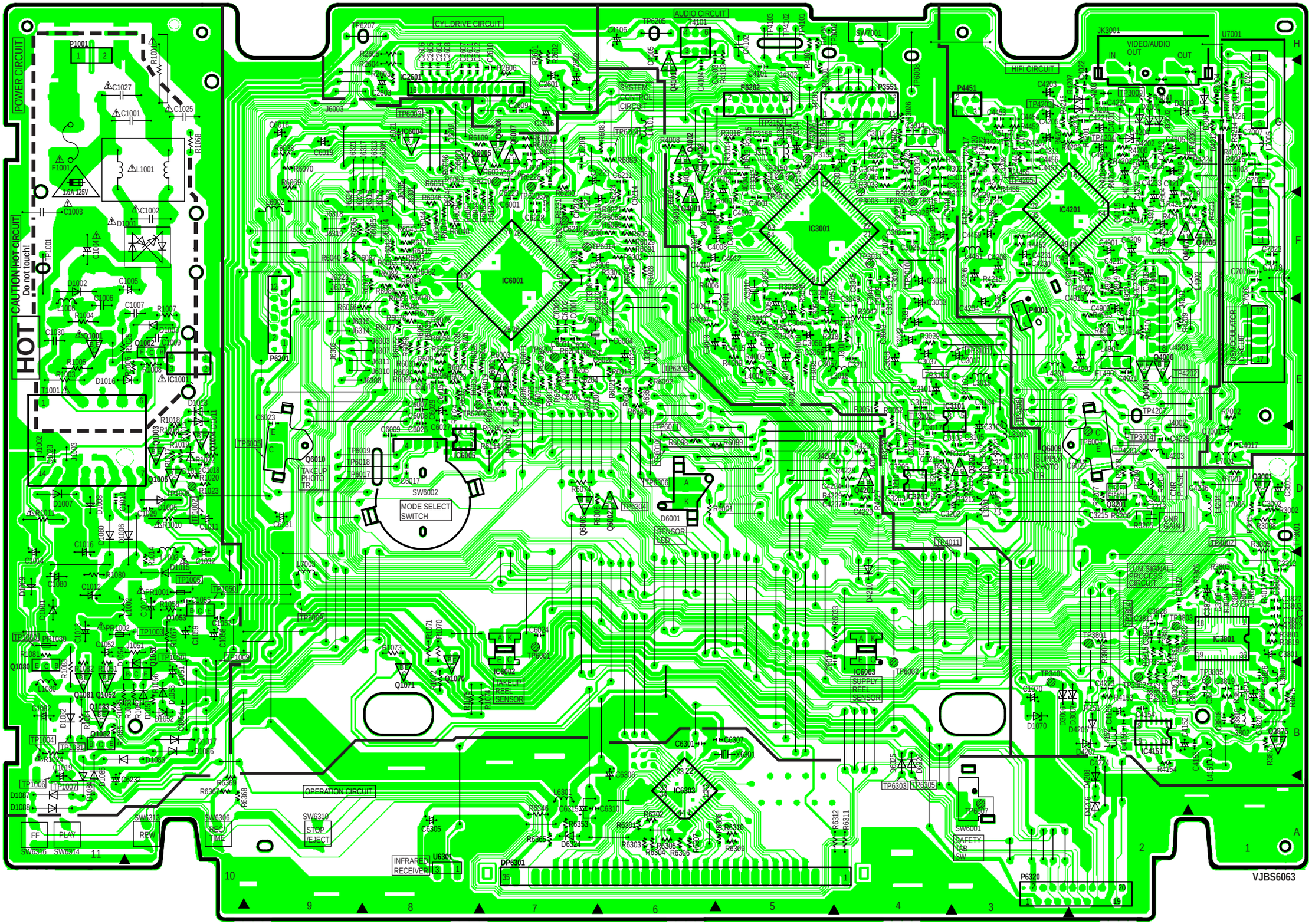
CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME
TYPE 1.6A 125V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

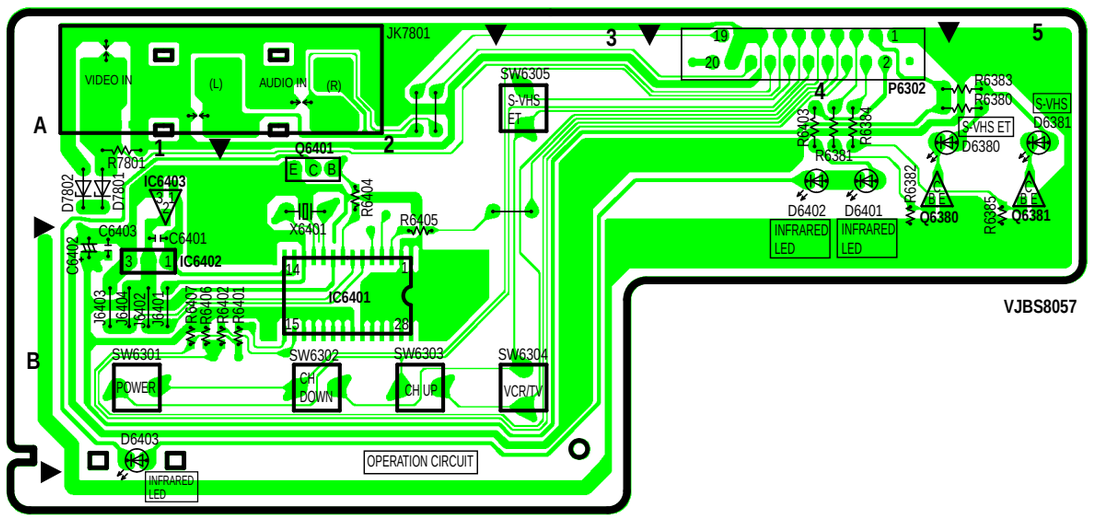
NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST FOR PROPER PARTS CONTENT.

HOT CIRCUIT.BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



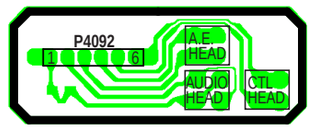
OPERATION C.B.A. VEPS8057C

NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST FOR PROPER PARTS CONTENT.



VJBS8057

AUDIO CONTROL HEAD P.C.B.

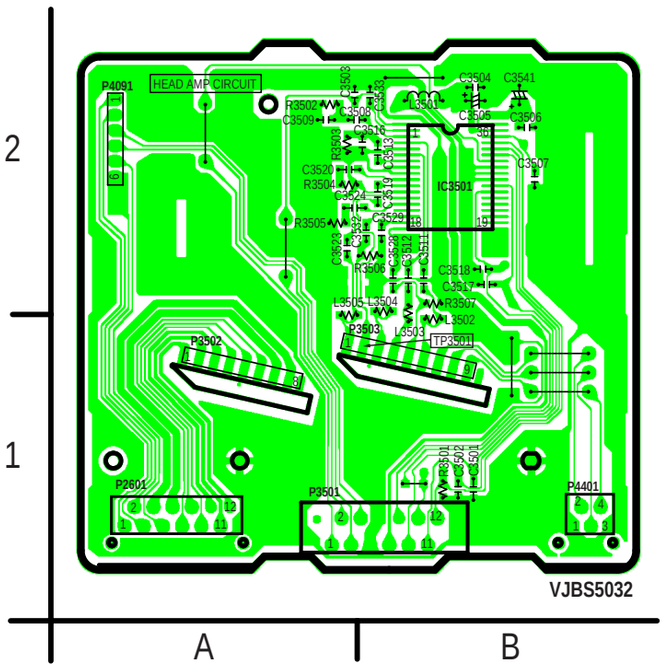


VJBS0A84

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A. VEPS5032A

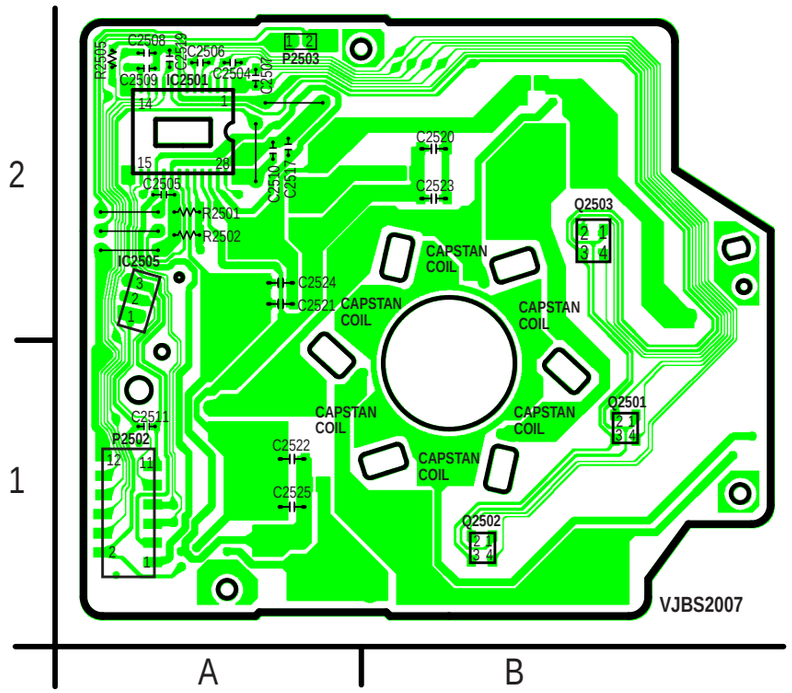
NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST FOR PROPER PARTS CONTENT.



VJBS5032

CAPSTAN STATOR C.B.A. VEMS0333

NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST FOR PROPER PARTS CONTENT.



VJBS2007

NOTE:
WHEN INSTALLING THE IC2501(AN3845SC OR AN3846SC) OR CAPSTAN STATOR C.B.A.,
BE SURE TO APPLY SILICON GREASE(VFK1301). REFER TO "CAPSTAN STATOR C.B.A."
OF MACHANISM SECTION IN DISASSEMBLY/ASSEMBLY PROCEDURES.

NOTE:
THE FOLLOWING PARTS ON THE CAPSTAN STATOR C.B.A. ARE NOT SUPPLIED SEPARATELY.
PLEASE ORDER AND REPLACE WITH THE CIRCUIT BOARD ASSEMBLY INSTEAD OF INDIVIDUAL PARTS.
(Q2501, Q2502, Q2503, CAPSTAN COIL)

1. **Important safety notice**
   Components identified by the sign ⚠ have special characteristics important for safety. When replacing any of these components. Use only the specified parts.

2. Do not use the part number shown on this drawing for ordering.
   The correct part number is shown in the parts list, and may be slightly different or amended since this drawing was prepared.

3. Use only original replacement parts:
   To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Parts different in shape or size may be used.
   However, only interchangeable parts will be supplied as service replacement parts.

5. Test point information
   ⓘ :Test point with a jumper wire across a hole in P.C.B.
   ▭→ :Test point with a component lead on the foil side.
   ▨ :Test point with no test pin.
   ● :Test point with a test pin.

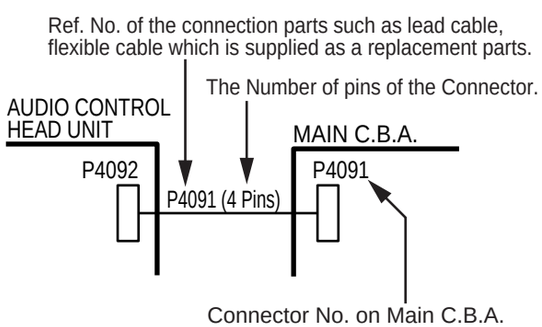
Schematic Diagram Notes

1. Indication for Zener Voltage of Zener Diodes
   The Zener Voltage of Zener Diodes are indicated as such on Schematic Diagrams.

   Example:
   (6.2V).....Zener Voltage

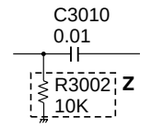
2. How to identify Connectors
   Each connector is labeled with a Connector No. and Pin No. Indicating what it is connected to, in other words, its counter part.
   Use the interconnection schematic diagram to find the connection between associated connectors.

   Example:
   The connections between C.B.A.s are shown below.


Ref. No. of the connection parts such as lead cable, flexible cable which is supplied as a replacement parts.
The Number of pins of the Connector.
AUDIO CONTROL HEAD UNIT
MAIN C.B.A.
P4092
P4091 (4 Pins)
P4091
Connector No. on Main C.B.A.

3. Parts enclosed in dashed lines marked "Z" are not used in any models included in this service manual.

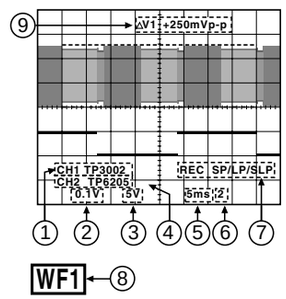
   Example:



4. The part number shown on this drawing is only main part number, except for safety parts. Be sure to make your orders of replacement parts according to the parts list.

Signal Waveform Note

How to read Signal Waveform



① Connecting Point
② Volts/Div
③ Volts/Div
④ Connecting Point
⑤ Time/Div
⑥ Trigger Channel of the scope (1:CH1,2:CH2)
⑦ Operation Mode of VCR
⑧ Waveform Point on Schematic
⑨ ΔV1:Peak to Peak

Voltage Chart Note

Voltage Measurement
a. Color bar signal in SP mode.
b. ---:Unmeasurable or not necessary to measure.

Circuit Board Layout Note

Circuit Board Layout shows components installed for various models.
For proper parts content for the model you are servicing, please refer to the schematic diagram and parts list.

NOTE:
Circuit Board Layout includes components which are not used.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

IC6001 KEY MATRIX

OUT / IN	SCAN 1 PIN 93	SCAN 2 PIN 94
DATA 8 PIN 40	——	REW /REV
DATA 9 PIN 41	——	PLAY
DATA 10 PIN 43	——	STOP /EJECT
DATA 11 PIN 44	POWER	CH DOWN
DATA 12 PIN 45	CH UP	TV/VCR
DATA 13 PIN 46	REC /TIME	FF /CUE

CAPSTAN SERVO
CYLINDER SERVO

TO MAIN III: UNSW +5V(SYS.CTL) 1
IC6005 KS24C011CS (MEMORY) — SERIAL DATA, SERIAL CLOCK, WRITE PROTECT, GND, VCC
R6100 220, R6114 220
C6001 0.1, C6014 Z, C6027 0.1, C6029 22/6.3V Z
TP6010, TP6011, WF22 TP6205
R6022 33K, R6023 5600 Z, R6024 5600, R6031 56K Z, R6034, R6095, R6096, R6097 Z
D6003, R6038 56 1/4W, C6016 330/6.3V
R6037 390 1/4W
Q6005 2SA1037K146R (SWITCHING POWER ON-ON)
Q6006 2SC4081T106R (SWITCHING POWER ON-ON)
Q6007 DTA143EU (IC6001 RESET)
R6110 10K, R6109 10K, C6018 Z, C6019 100/6.3V, R6060 4.7M
IC6004 MN12821-RTX (IC6001 RESET) — RESET, C6021 0.01 — Z
R6010 1800, Q6001 2SC4081T106R (IC6001 RESET), R6012 1K, C6033 0.1
C6010 100P Z
R6075 22K Z, R6008 10K
C6013 Z, C6015, C6017, C6025, C6007, C6008, C6009

TO MAIN II: DELAY REC +12V 3
Q6002 2SB709A(R,S) (SWITCHING REC-ON)
R6006 10K
R6015 1K, R6014 1K
TO MAIN VI: AUDIO BLACK DETECT 18, VIDEO BLACK DETECT 17
TO MAIN II: INPUT SELECT 2 5, V-LOCK PULSE 6
R6016 22K
TO MAIN IV: Hi-Fi HEAD SW 8, Hi-Fi PB(H) 10
TO MAIN V: 3.58MHZ 11, KEY DATA 8 12
R6017 Z, R6003 2200, R6019 220, R6120 220, R6025 3300, R6026 1K, R6027 100, R6035 1K, R6036 56K, R6039 1K, R6057 1K, R6058 Z, R6059 1K, R6072 10K, R6076 10K, R6077 1K, R6078 220, R6079 220, R6080 10K
R6007 2700
RESET
V-LOCK PULSE
3.58MHz
Hi-Fi HEAD SW
VIDEO DELAY REC(H)
Hi-Fi PB(H)
SAFETY TAB
VIDEO BLACK DETECT(L)
AUDIO BLACK DETECT(L)
CAP ERROR
CYL ERROR
IC6301 CLK
VDD
OSC 2
OSC 1 — 14MHz
GND
KEY DATA 8
KEY DATA 9
SXI
KEY DATA 10
KEY DATA 11
KEY DATA 12
KEY DATA 13
VIDEO
GND
VIDEO
SYNC
HEAD SW
INPUT SELECT 2
I2C SERIAL CLOCK
I2C SERIAL DATA
SERIAL DATA 0
DATA 0
SERIAL CLOCK 0
SERIAL DATA 1
SERIAL CLOCK 1
TV(L)/VCR(H)
CH FREQUENCY LOCK
SIGNAL(L)
LOADING MOTOR FORWARD(H)
LOADING MOTOR REVERSE(H)
IR DATA
EV-MASK(H)
CAP TORQUE LIMIT 1
CAP DIRECTION CTL
FORCED ACCELERATION
SUPPLY REEL PULSE
TAKEUP REEL PULSE

Q6003 2SC4081T106R (SWITCHING DELAY REC ON-ON)
WF19 TP6209
R6203 10K, R6202 270K, C6202, C6201 1000P Z
TP6007, R6074 2700 1/4W
TP6208, R6205 47K, R6204 180K, C6204 Z, C6203 0.01
SW6001 LSSH0002 SAFETY TAB SW
WF26 TP6201, TP6202
R6093 10K
X6001 VSXS0232-TB, C6002 0.1 Z, C6003 0.1 Z, C6004 1P Z, C6005 15P, C6006 10P
IC6001 MN101D02HPS1 (SYSTEM CONTROL/SERVO/TIMER MICROCONTROLLER)
R6081 100K, R6089 1K

TO MAIN V: KEY DATA 9 13, KEY DATA 12 14, KEY DATA 13 15, KEY DATA 10 7, KEY DATA 11 8
TO MAIN II: VIDEO 20, VIDEO 21
TO MAIN III: SW +5V(VIDEO) 22
R6001 100 1/4W, D6001 VEKS5708 (SENSOR LED)
C6028 Z
R3301 1K, C3303 120P, C3302 1, C3308 0.1
R3305 1500, C3306 0.47/50V, R3302 3900
TP6014
R6090 1K, R6028 10K, R6029 560, R6030 1K, R6065 2700, R6068 1K, R6071 1K
R6231 2.2M, C6213 100P Z, C6217 0.1, C6218 10/16V, R6224 4700, C6221 22/6.3V
WF21 TP6204, WF20 TP6203
C6214 1000P, C6210 0.056, C6211 2700P Z, C6208 0.1
C6224 330/6.3V

TO MAIN IV: AUDIO MUTE(H) 46
TO MAIN V: CATV SCK 121
TO MAIN II: IC6301 CS(L) 25, 3CH(H)/4CH(L) 26, AUDIO MUTE(H) 51, A-DEFEAT(H) 28, DTS CS(H) 27, PB(L) 32, CUE/REV/SS(L) 44
TO MAIN IV: CYL ERROR 30
TO MAIN V: CYL PG/FG 31
TO MAIN VI: CTL HEAD 70, CTL HEAD GND 71
VDD, AFC, AFC, BLACK (H), CATV SCK, IC6301 CS(L), 3CH(H)/4CH(L), AUDIO MUTE(H), AUDIO DEFEAT(H), DTS CS(H), PB(L), CUE/REV/SS(L), GND, CYL PG/FG, GND, CAP FG, CAP FG, V-REF 1, V-REF 2, GND, CTL AMP, VDD
CTL PULSE(-), CTL PULSE(+), TPZ, PB CONTROL PULSE
TP6211, WF23, C6216 0.01
WF25 TP6206, C6223 1000P
R6228 1500, C6222 2700P, R6230 2200, C6228 0.1, C6230 0.1 Z, C6031 0.1

POWER DOWN(L), ENVELOPE DET, HEAD AMP SW, ROTARY SW, MODE SW POSITION A, MODE SW POSITION B, MODE SW POSITION C, SCAN 2/CATV CS(L), SCAN 1/CATV DATA, KEY DATA 0, KEY DATA 1, KEY DATA 2, KEY DATA 3, KEY DATA 4, KEY DATA 5, SW+14V ON(H), 5000H(L), SW+22V ON(H), POWER ON(L), MTS MODE, AFC, SUPPLY PHOTO TR(L), TAKEUP PHOTO TR(L), ENV-VOLTAGE, TPZ
R6082 10K, C6026 1000P, R6088 10K, R6084 Z, R6083 Z
R6062 15K, R6063 15K, R6064 15K
J6003 Z
R6115 1K, R6116 1K
R6049 4700, R6051 4700, R6052 4700, R6054 10K
TP6003, TP6210
R6085 22K, R6086 22K, R6087 22K
TP6019, TP6018, TP6017
R6069 100K, R6070 100K, R6073 47K, R6033 680 1/4W, R6066 47K
TP6004, TP6005, TP6001, TP6009, TP6002, TP6008
Q6009 VEKS5707 (SUPPLY PHOTO TR)
Q6010 VEKS5707 (TAKEUP PHOTO TR)
C6022 1000P Z, C6023 1000P Z
IC6002 SG-PK01 (TAKEUP REEL SENSOR)
C6024 100P
IC6003 SG-PK01 (SUPPLY REEL SENSOR)
C6011 100P
C6231 100/6.3V
L6002 100

SW6002 LSSS0012 MODE SELECT SWITCH: POSITION A, POSITION B, POSITION C

TO MAIN II: CH FREQUENCY LOCK 9, I2C SERIAL CLOCK 73, I2C SERIAL DATA 74
TO MAIN III: SW +12V 34, POWER DOWN(L) 35
TO MAIN II: HEAD SW 36
TO MAIN IV: I2C SERIAL CLOCK 37, I2C SERIAL DATA 38
TO MAIN II: SERIAL DATA 0 39
TO MAIN V: SERIAL DATA 1 41, SERIAL CLOCK 1 42, SERIAL CLOCK 0 43
TO MAIN II: TV(L)/VCR(H) 30, SIGNAL(L) 45
TO MAIN V: IR DATA 47
TO MAIN VI: E/V-MASK(H) 50
TO MAIN II: 500H(L) 110, ENV-DET 52, HEAD AMP SW 53, ROTARY SW 54
TO MAIN V: SCAN 2/CATV CS(L) 55, SCAN 1/CATV DATA 56, KEY DATA 0 57, KEY DATA 1 58, KEY DATA 2 59, KEY DATA 3 60, KEY DATA 4 61, KEY DATA 5 62
TO MAIN III: SW +14V ON(H) 68
TO MAIN IV: MTS MODE 64
TO MAIN II: AFC 67, ENV-VOLTAGE 66
TO MAIN III: SW +22V ON(H) 84, POWER ON(L) 33, UNSW +14V 82

TO CAPSTAN STATOR C.B.A. P2502 — P6201:
2 UNSW +5V(SYS.CTL)
7 LD-M FWD(H)
5 LD-M REV(H)
3 UNSW +5V(SYS.CTL)
12 GND
11 GND
9 CAP FG(+)
8 CAP TORQ.LIM
10 CAP DIRECTION CTL
4 CAP ERROR
6 V-REF
1 UNSW +14V

UNLESS OTHERWISE SPECIFIED;
DIODES IS MA165/WG713A/1SS133T,
SWITCHES IS EVQ21309K AND
WATTAGE OF RESISTORS IS 1/10W.

VJBS6063

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'T INCENDIE N'I UTILISERQUE DES FUSIBLE DE MÉME
TYPE 1.6A 125V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

HOT CIRCUIT. BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.

HOT

NOTE: THE VOLTAGE FOR PARTS IN HOT CIRCUIT
IS MEASURED USING TP1001
AS A COMMON TERMINAL.

UNLESS OTHERWISE SPECIFIED;
DIODES IS MA165/1SS119/1SS133T AND
WATTAGE OF RESISTORS IS 1/10W.

VJBS6063

AC CORD
P1001 AC120V 1 / AC120V 2
F1001 1.6A/125V
C1027 0.01 250V
C1001 0.01 250V
C1002 3300P 125V
D1001 S1WBA60-4062
T1001 LST0098
L1001 18M
C1004 120/200V
R1001 2.7M 1/2W
C1025 100P 125V
C1003 3300P 125V
R1003 330K 1/2W
R1004 33K 2W
C1005 4.7/200V
D1002 EG01V1
C1006 220P 500V
L1006 VLPS0083
Q1002 2SD2259 (SWITCHING CONTROL)
Q1001 2SC4130LF608 /2SC4559LP.KT (SWITCHING)
WF27
WF33
C1009 0.018
R1005 56 1W
C1030 0.018
TP1001
D1003 ERA18-04V3
R1025 15 1/2W
C1007 0.22
R1008 3900 1/4W
R1006 2200
D1016
WF28
R1007 100 1/4W
R1068 0 1/4W
J1002
J1003 Z
IC1001 PS2501-1-X /ON3131-R.KT /ON3131-S.KT (ERROR VOLTAGE DET)
D1011 MA4051N-TAKT (5.1V)
R1014 220
C1021 1/50V
R1015 220
Q1003 2SC4081T106R /2SD1819A(R,S) (ERROR VOLTAGE DET)
R1016 5600 1/8W
R1017 10K
R1018 18K
C1018 0.1
R1019 3900
R1020 6800
D1012 MA858
D1013
R1022 220
Q1004 2SA1037K146R /2SB709A(R,S) (ERROR VOLTAGE DET)
Q1005 2SA1576A106R /2SB1218ARS (POWER DOWN-OFF)
TP1008
R1023 100K 2W Z
C1029 100P
D1005 EG01V1
R1010 10 1/4W
TP1002
C1011 4.7/50V
Z C1054 0.01
C1010 100P
D1006 ERB32-01L3
C1012 330/18V
D1015 MA7180 (18V)
L1002 22
PR1002 ICP-N38-TP1 /LSSF0009A25E /UNH000600A
C1013 330/25V
TP1003
WF29
WF30
J1001 Z
D1080 EK19V1
C1080 330/35V
D1081 MA7240A-TR
R1080 10K
PR1080 ICP-N38-TP1 /LSSF0009A25E /UNH000600A
TP1080
D1007 MA188
R1011 10 1/4W
C1014 4.7/50V
TP1004
R1024 33 1/4W
WF31
D1008 EC21QS03L
C1016 330/18V
L1003 10
PR1001 ICP-N38-TP1 /LSSF0009A25E /UNH000600A
C1017 1000/6.3V
WF32
D1009 D1FS4
TP1006
C1019 100/6.3V
C1023 0.1
TP1007
D1083 ERA15-01V5
D1084 ERA15-01V5
D1087 ERA15-01V5
D1088 ERA15-01V5
D1085 ERA15-01V5
Q1082 2SB1398(PQ) (+14V REGULATOR)
R1085 1K
R1084 1200 1/2W
D1086 ERA15-01V5
Q1083 2SD601(R,S) (SWITCHING)
R1086 10K
68 SW +14V ON(H)
77 UNSW +33V
TP1058
Q1051 2SD1581(T) /2SD2159(T) (SWITCHING POWER ON +12V)
J1051
D1054 Z
C1052 10/16V
C1051 0.47/50V
78 SW +12V
86 SW +12V
34 SW +12V
R1052 15K 1/4W
R1053 15K 1/4W
D1051 MA4110N-H (11V)
R1056 Z
Q1052 2SC2412K1 /2SD601(R,S) (SWITCHING POWER ON-OFF)
R1051 1200
33 POWER ON(L)
19 UNSW +14V
120 UNSW +14V
D1017 ERA15-01V5 Z
82 UNSW +14V
TP1081
Q1080 2SB1398(PQ) (+22V REGULATOR)
R1081 1K
C1082 Z
R1083 1200 1/2W
Q1081 2SD601(R,S) (SWITCHING)
R1082 10K
84 SW +22V ON(H)
TP1005
Q1053 2SD2097TV2R /2SD235800A (SWITCHING POWER ON +5V)
TP1050
C1032 220 6.3V Z
C1055 0.01 Z
C1057 0.01 Z
C1058 100/6.3V
C1059 47/16V
R1057 330 1/4W
R1058 100K 1/4W
R1070 22K 1/4W
Q1070 2SB709A(R,S) (SWITCHING POWER ON-ON)
R1071 150K 1/4W
R1074 2700 1/4W
TP1009
R1072 47K 1/4W
R1075 2700 1/4W
Q1071 2SD601(R,S) (SWITCHING POWER ON -5V)
R1073 22K 1/4W
D1070 MA4056-M (5.6V)
C1070 100/16V
79 UNSW +5V(SYS.CTL)
2 UNSW +5V(SYS.CTL)
1 UNSW +5V(SYS.CTL)
22 SW +5V(VIDEO)
87 SW +5V(VIDEO)
80 SW +5V(VIDEO)
104 SW +5V(VIDEO)
81 AUDIO -5V
123 SW -30V
83 F+
122 F-
35 POWER DOWN(L)

TO MAIN I
TO MAIN II
TO MAIN IV
TO MAIN I
TO MAIN VI
TO MAIN V
TO MAIN I
TO MAIN I
TO MAIN V
TO MAIN VI
TO MAIN I
TO MAIN IV
TO MAIN II
TO MAIN VI
TO MAIN II
TO MAIN V
TO MAIN I

REC VIDEO SIGNAL
REC AUDIO SIGNAL

DP6301 VSZS0131

SLP
VCR
Hi-Fi
AM
PM

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

TO MAIN III
F+ 83
UNSW -30V 123
F- 122
UNSW +5V(CYS.CTL) 79

TO MAIN I
IC6301 CS(L) 25
SERIAL DATA 1 41
SERIAL CLOCK 1 42

R6311 27 1/4W
R6312 27 1/4W
R6353 47K
D6324 MA4056-M (5.6V)
C6315 100/50V
C6310 Z

R6301 68K
R6302 68K
R6303 68K
R6304 68K
R6305 68K
R6306 68K
R6307 68K
R6308 68K
R6309 68K
R6310 68K

L6301 100
C6306 470/6.3V
C6307 0.1

X6301 EF0EC4004T4
C6301 Z

IC6303 MN12510F
(INDICATOR PANEL CONTROL)

DIGIT 4
DIGIT 5
DIGIT 6
DIGIT 7
DIGIT 8
DIGIT 9
DIGIT 10
DIGIT 13/SEGMENT14
DIGIT 3
DIGIT 2
DIGIT 1
DIGIT 0
UNSW-30V
VDD
X OUT
X IN
GND
IC6301 CS(L)
SERIAL CLOCK 1
SERIAL DATA 1
DIGIT 14/SEGMENT13
DIGIT 15/SEGMENT12
SEGMENT11
SEGMENT10
SEGMENT 9
SEGMENT 8
SEGMENT 7
SEGMENT 6
SEGMENT 5
SEGMENT 4
SEGMENT 3
SEGMENT 0
SEGMENT 1
SEGMENT 2

J6301 J6302 Z J6303 Z J6304 Z
J6305 J6306 Z J6307 Z J6308 Z
J6309 Z J6310 J6311 Z J6312 Z
J6313 Z J6314 Z J6315 Z J6316
J6317 Z J6318 Z J6319 Z J6320 Z
J6321 Z J6322 Z J6323 Z J6324 Z

SCAN 2/CATV CS(L) 55
SCAN 1/CATV DATA 56
KEY DATA 0 57
KEY DATA 1 58
KEY DATA 2 59
KEY DATA 3 60
KEY DATA 4 61
KEY DATA 5 62
KEY DATA 11 8
KEY DATA 12 14
KEY DATA 10 7
KEY DATA 13 15
KEY DATA 8 12
KEY DATA 9 13

TO MAIN I

D6325
D6326

R6364 100K
R6365 100K
R6366 100K
R6367 100K
R6368 100K
R6369 100K

TP6305
TP6306
TP6303
TP6304

SW6310 STOP/EJECT
SW6306 REC/TIME
SW6316 FF
SW6313 REW
SW6314 PLAY

U6301 PNA4611M03KT
OUT GND Vcc
INFRARED RECEIVER UNIT

R6346 47 1/4W
C6305 47/6.3V

J4151 Z

R6361 4.7 1/8W

TO OPERATION C.B.A. P6302
P6320

47 IR DATA — TO MAIN I
75 VIDEO 2
85 AUDIO 2 L CH — TO MAIN II
88 AUDIO 2 R CH — TO MAIN IV
121 CATV SCK — TO MAIN I
120 UNSW +14V — TO MAIN III

P6320:
2 UNSW +14V
8 CATV SCK
5
4
16 AUDIO 2 R CH
19 AUDIO 2 L CH
14 VIDEO 2
18 GND
17 GND
15 GND
1 GND
3 UNSW +5V(SYS.CTL)
12
10 SCAN 2
11 SCAN 1
13 KEY DATA 11
9 KEY DATA 12
7 CATV DATA
6 CATV CS(L)
20

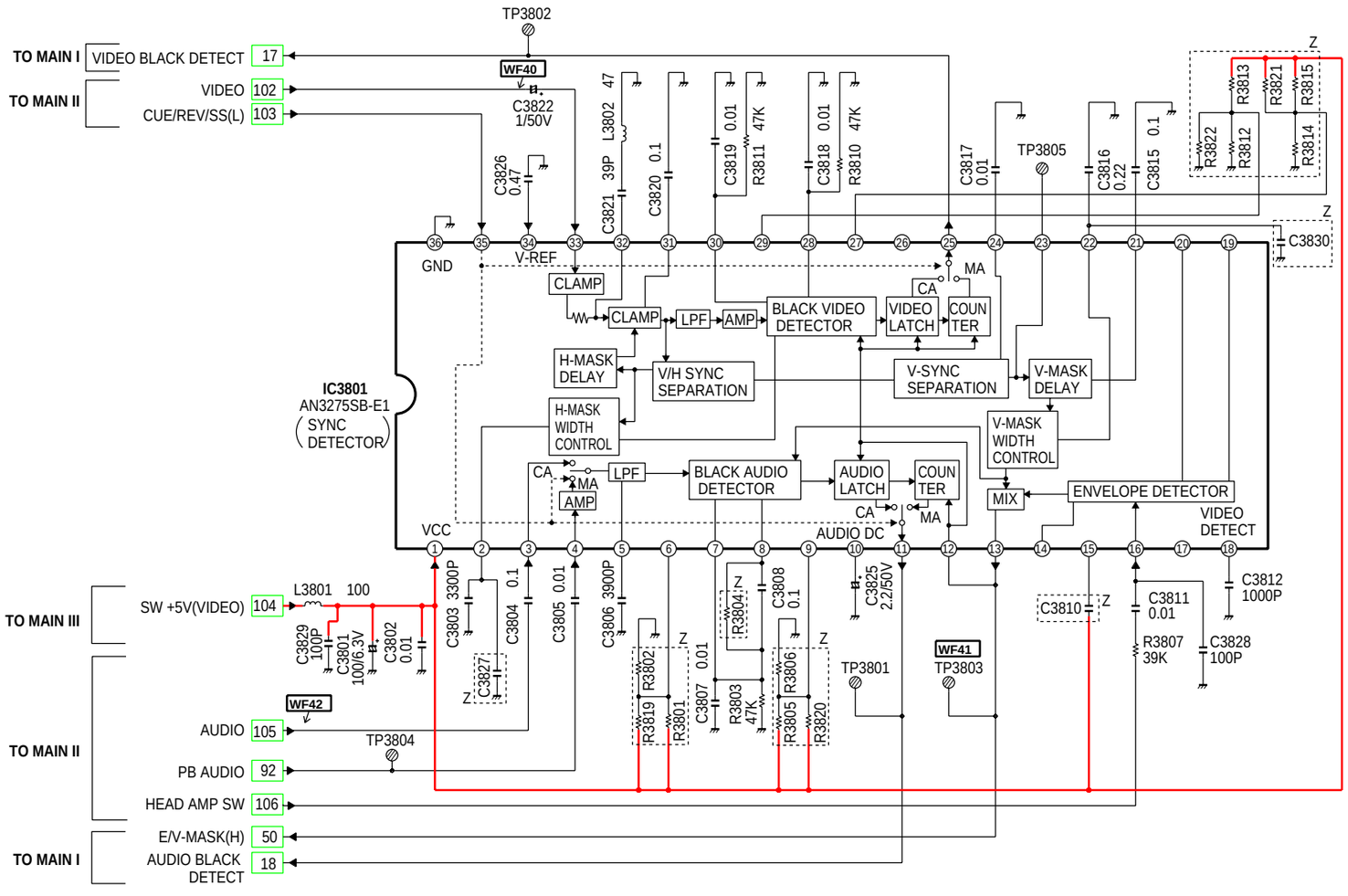
UNLESS OTHERWISE SPECIFIED;
DIODES IS MA165,
SWITCHES IS EVQ11A09K AND
WATTAGE OF RESISTORS IS 1/10W.

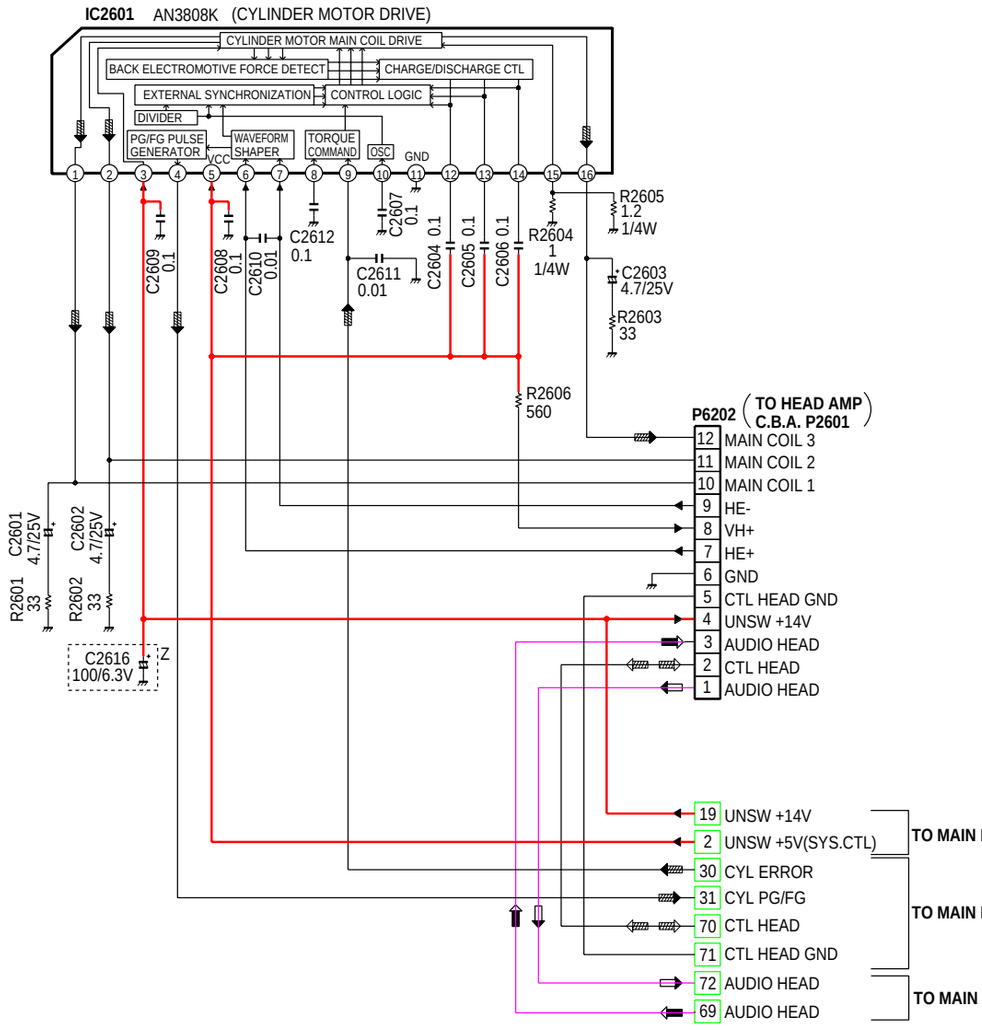
VJBS6063

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

REC AUDIO SIGNAL　PB AUDIO SIGNAL　CYLINDER SERVO　CAPSTAN SERVO



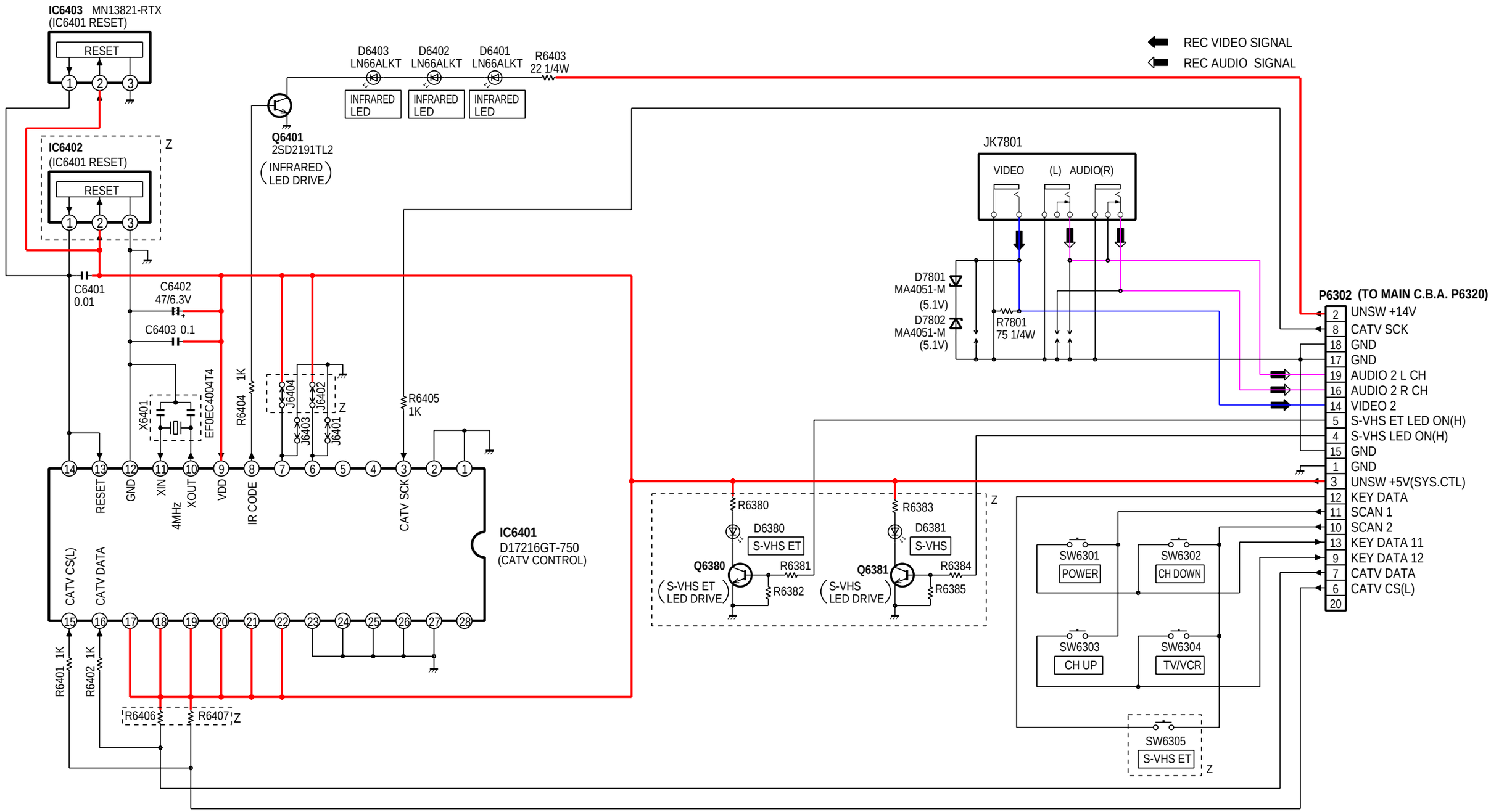


UNLESS OTHERWISE SPECIFIED;
WATTAGE OF RESISTORS IS 1/10W.

VJBS6063

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

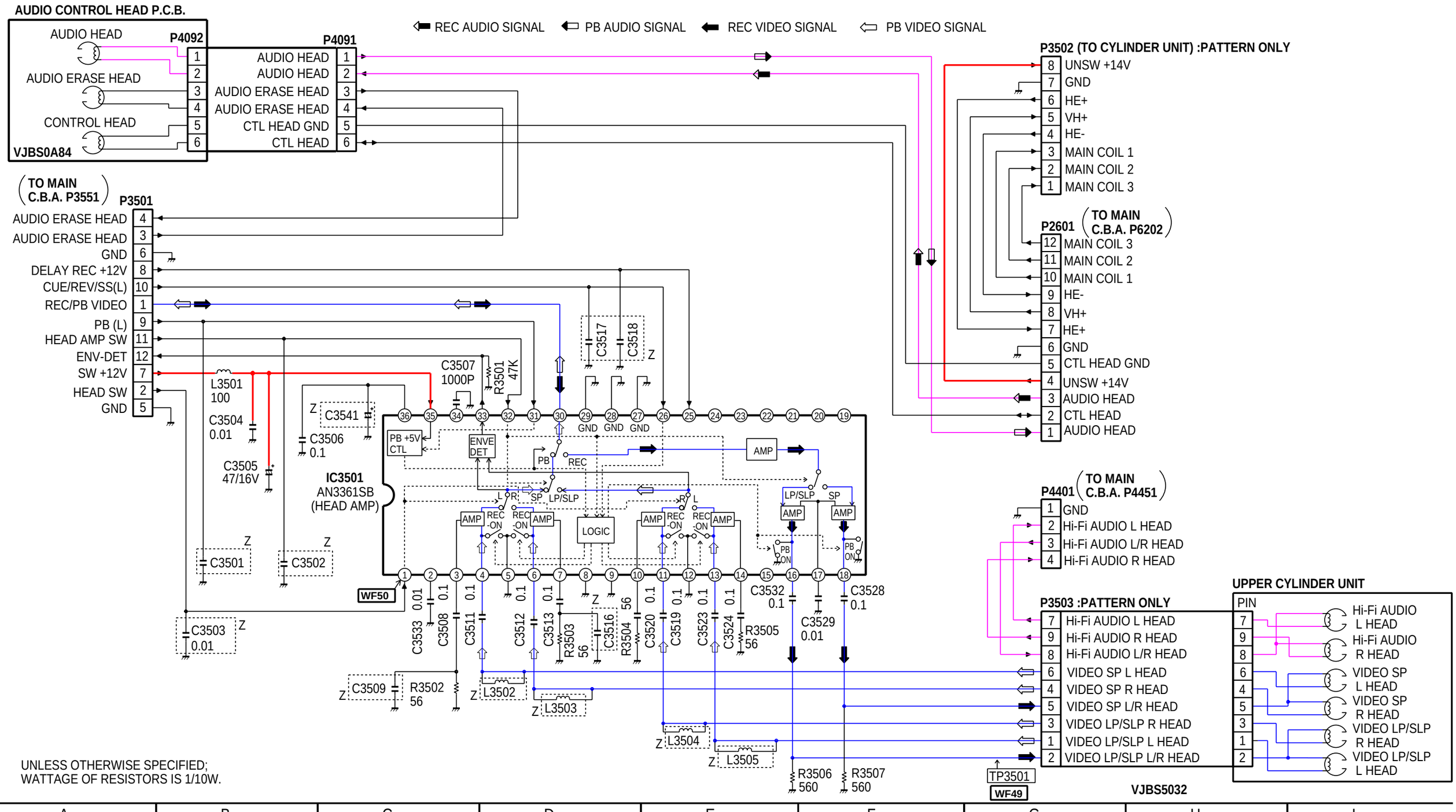


UNLESS OTHERWISE SPECIFIED;
SWITCHES IS EVQ11G05R AND
WATTAGE OF RESISTORS IS 1/10W.

VJBS8057

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.



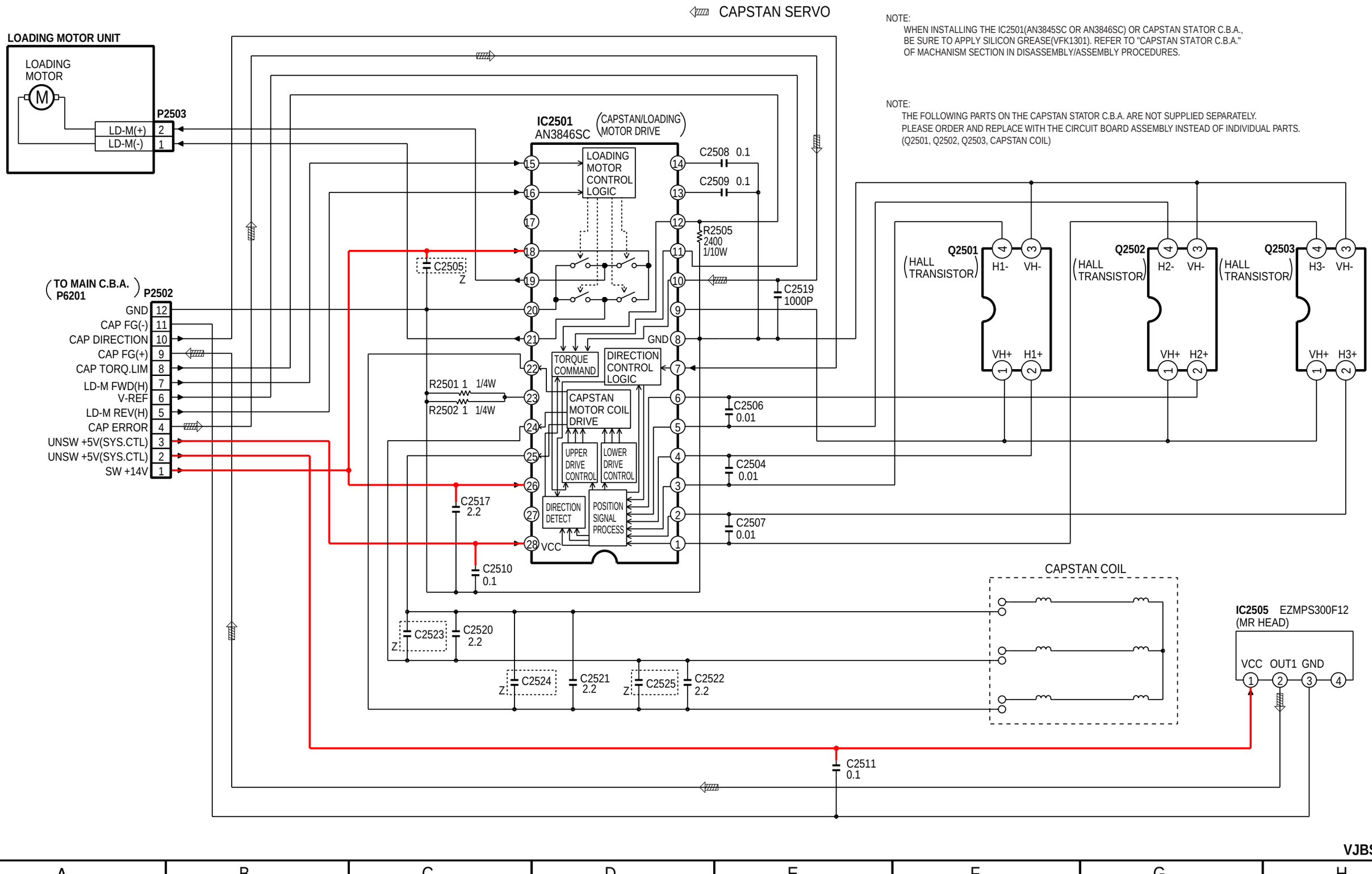
UNLESS OTHERWISE SPECIFIED;
WATTAGE OF RESISTORS IS 1/10W.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

NOTE:
WHEN INSTALLING THE IC2501(AN3845SC OR AN3846SC) OR CAPSTAN STATOR C.B.A.,
BE SURE TO APPLY SILICON GREASE(VFK1301). REFER TO "CAPSTAN STATOR C.B.A."
OF MACHANISM SECTION IN DISASSEMBLY/ASSEMBLY PROCEDURES.

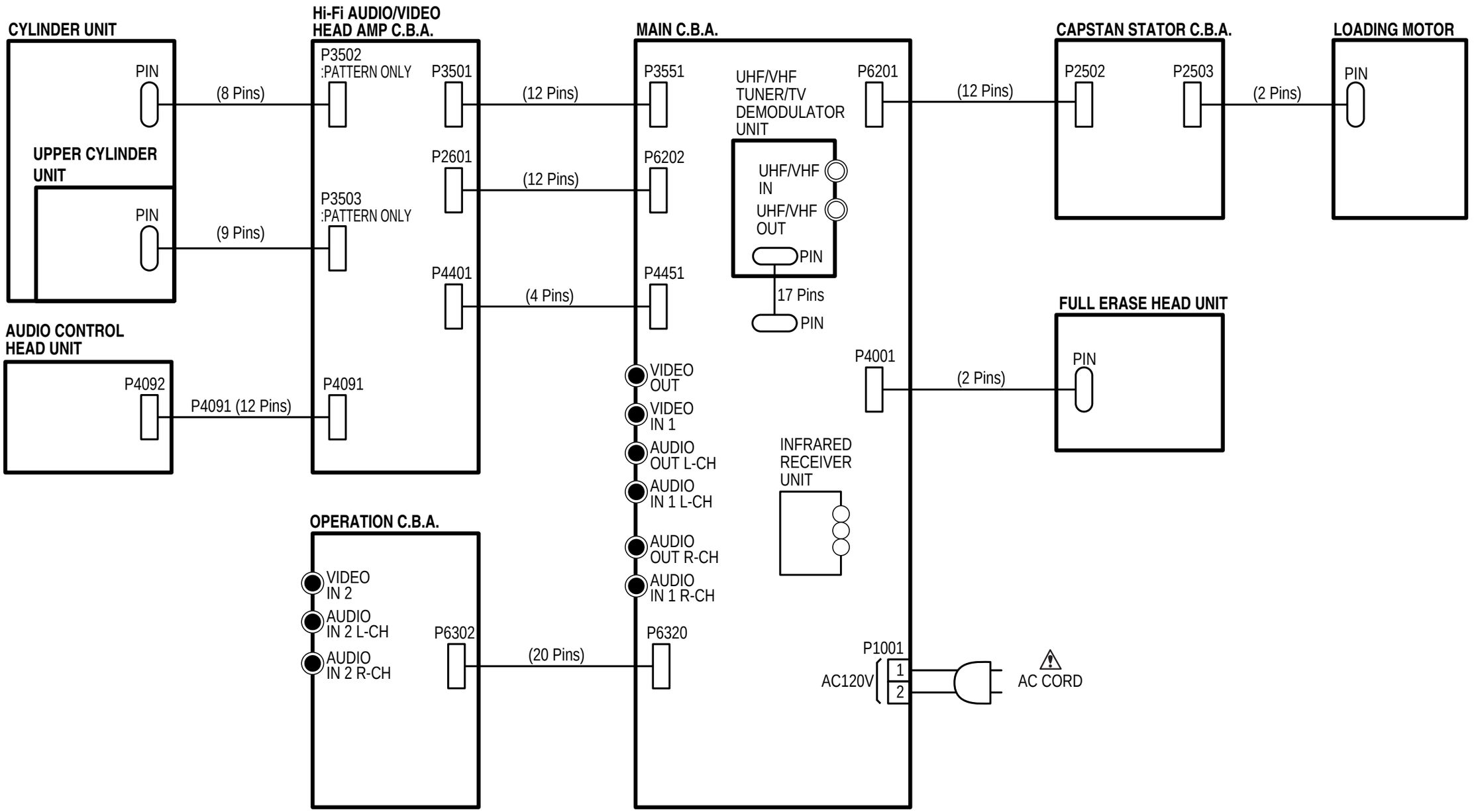
NOTE:
THE FOLLOWING PARTS ON THE CAPSTAN STATOR C.B.A. ARE NOT SUPPLIED SEPARATELY.
PLEASE ORDER AND REPLACE WITH THE CIRCUIT BOARD ASSEMBLY INSTEAD OF INDIVIDUAL PARTS.
(Q2501, Q2502, Q2503, CAPSTAN COIL)



VJBS2007

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.



NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

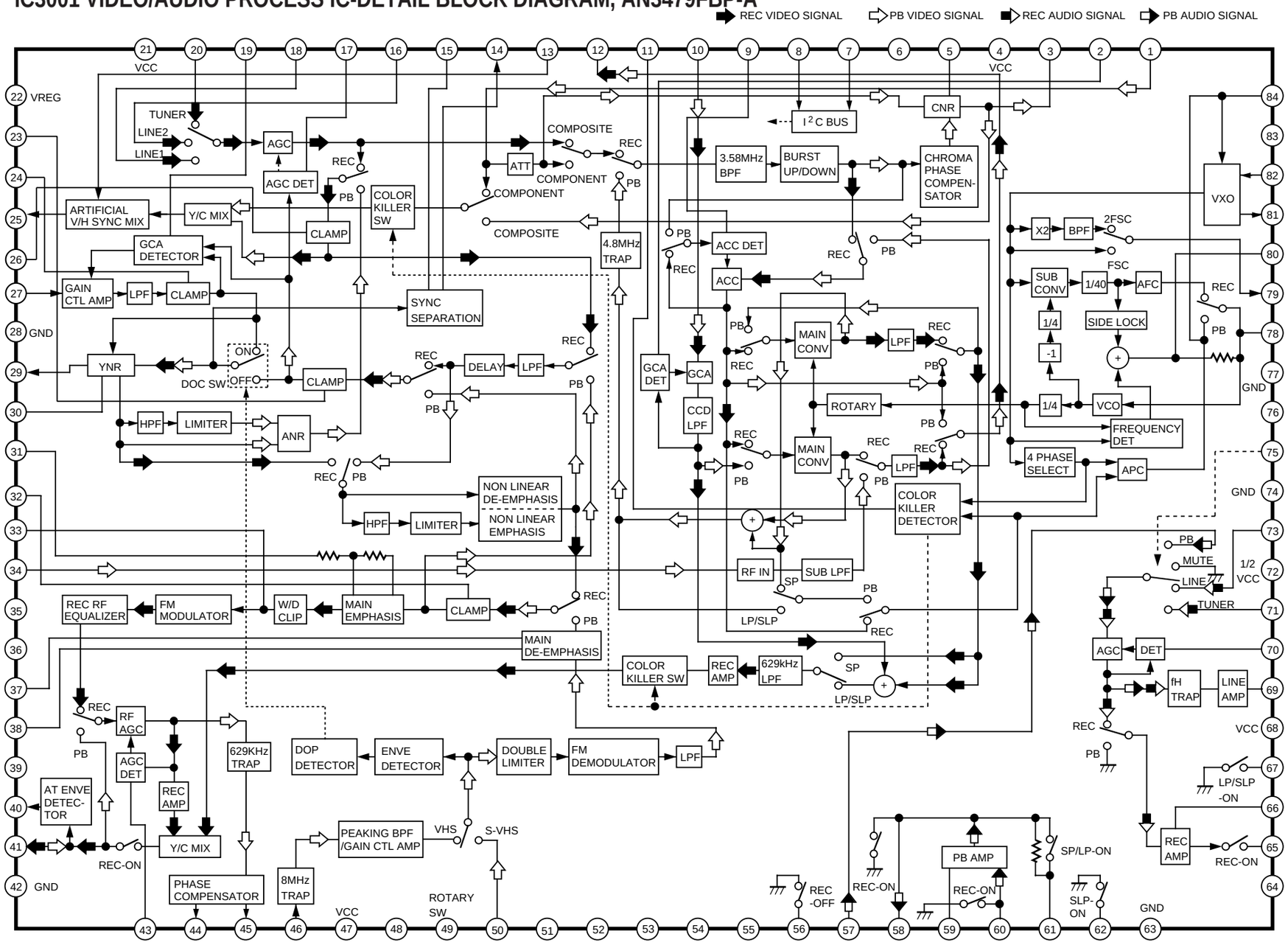
REC VIDEO SIGNAL
PB VIDEO SIGNAL
REC AUDIO SIGNAL
PB AUDIO SIGNAL
CYLINDER SERVO

IC3101 MN3885S (CCD 1H DELAY)
IC3201 MN3890S (CCD 1H DELAY)
Q3201 HN1B01F (PHASE COMPENSATOR)
Q3202 (AMP)
CNR GAIN
CNR PHASE
TO MAIN VI
TO MAIN IV
TO MAIN V
TO MAIN I
TO MAIN III
JK3001
IC4151 UPD4053BG (INPUT SELECT)
FL3001 VLFS0209
IC3001 AN3479FBP-A (VIDEO/AUDIO PROCESS)
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
WF15
WF16
WF17
WF18
SYNC SEPARATION
REC/PB CHROMINANCE SIGNAL PROCESS
REC/PB LUMINANCE SIGNAL PROCESS
S-VHS/VHS DET
ATENVELOPE DETECTER
Q3875 (BUFFER)
Q3001 (BUFFER)
Q4007 DTC114TU (AUDIO MUTE)
Q4005 DTC114TU (AUDIO MUTE)
Q4006 DTC114TU (AUDIO MUTE)
Q4004 DTA114TU (AUDIO MUTE)
Q4001 2SA1576A106R (AUDIO DELAY REC ON-OFF)
Q4002 2SD1819A(R,S) (AUDIO DELAY REC ON-OFF)
Q4003 2SD1819A(R,S) (AUDIO DELAY REC ON-OFF)
Q4101 2SC2412K1 (BIAS OSC)
T4101 EIQ7QF018Q
U7001 UHF/VHF TUNER/TV DEMODULATOR UNIT VEQS0614H
P3551 TO HEAD AMP C.B.A. P3501
P4001 FULL ERASE HEAD UNIT

UNLESS OTHERWISE SPECIFIED;
PNP TRANSISTORS IS 2SA1037K146R,
NPN TRANSISTORS IS 2SD601A AND
WATTAGE OF RESISTORS IS 1/10W.

VJBS6063

IC3001 VIDEO/AUDIO PROCESS IC-DETAIL BLOCK DIAGRAM, AN3479FBP-A



NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

REC AUDIO SIGNAL
PB AUDIO SIGNAL

TO MAIN I
TO MAIN II
TO MAIN I
MTS MODE 64
SIF OUT 94
A-DEFEAT(H) 28
I2C SERIAL DATA 38
I2C SERIAL CLOCK 37
AUDIO MUTE(H) 46

TO MAIN III
SW +5V(VIDEO) 87

FL4901
VLFS0212
C4921 Z
C4913 0.01
R4901 1K
C4915 100/6.3V Z
C4916 0.1
R4902 Z
C4914 Z
R4903 Z
C4917 0.1
C4920 0.1
C4919 0.1
C4918 0.1
C4907 Z
C4903 3.3/50V
C4902 2.2/50V
L4201 100
C4230 47/6.3V
C4231 0.1 Z
R4453 33K
R4456 Z
C4206 10/16V
C4208 10/16V
C4204 33/6.3V
R4216 Z
C4212 0.015
C4227 0.22
R4220 Z
R4455 1500
L4451 100
C4459 100/6.3V
C4458 0.1 Z
C4229 0.01
R4228 10K
Q4201 (BUFFER) Z
R4227 0
R4229 0 Z
R4230 2700 Z
C4234
C4237 Z
J4203 Z
J4204 Z
11 3.58MHZ
91 3.58MHZ

48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33
GND VCC GND AUDIO MUTE(H)

MTS/SAP SIGNAL PROCESS
MTS MUTE CONTROL
I2C CONTROL
ENV DETECTOR
R-CH Hi-Fi AUDIO SIGNAL PROCESS
L-CH Hi-Fi AUDIO SIGNAL PROCESS
AGC AMP
REC AMP
AGC DET

49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
VCC GND VCC

32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17

WF35
WF36
WF37
WF38
WF34

C4908 Z
C4909 Z
C4910 Z
C4210 10/16V
C4901 1/50V
C4209 10/16V
C4216 10/16V
C4217 22/6.3V
C4218 10/16V
C4911 0.022
C4904 3.3/50V

TO MAIN II
AUDIO R CH 97
AUDIO L CH 96
RF AUDIO 95
NORMAL AUDIO 101
NORMAL AUDIO 98
R4210 1K
R4209 1K
J4202
J4201
R4224 33K
R4225 10K
C4219 1/50V
C4215 0.1 Z
C4214 100/16V

IC4201
AN3662FBP
(Hi-Fi AUDIO MTS/SAP PROCESS)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
GND GND GND
TUNER (R-CH) LINE1 LINE2
TUNER (L-CH) LINE1 LINE2

C4232 Z
C4233 Z
C4912 0.1 10/16V
C4213 10/16V
C4202 4.7/25V 10/16V
C4905 10/16V
TP4208
C4201 4.7/25V
C4906 1/50V
R4215 Z
C4203 33/6.3V
R4207 8200
R4203 8200

R4205 47K
C4223 Z
D4205 MA4091 /RD9.1ESAB2 (9.1V) Z
D4207 MA4091 /RD9.1ESAB2 (9.1V)
R4201 47K
TP4203
C4221
D4201 Z
D4203
R4206 47K
R4208 8200
C4224 Z
D4206 MA4091 /RD9.1ESAB2 (9.1V) Z
D4208 MA4091 /RD9.1ESAB2 (9.1V)
R4202 47K
TP4204
R4204 8200
C4222
D4202 Z
D4204

D4209 MA165
R4221 1500
R4222 1500
TP4205
TP4207
TP4206
R4226 1500
C4228 0.01
C4220 Z
C4455 0.1
R4217 Z
C4451 0.01
R4451 Z
C4453 0.01 Z
R4223 10K
R4452 Z
C4454 0.01 Z
R4454 Z
C4457
C4452 0.01
C4456 0.1
C4211 0.015
C4207 10/16V
C4205 10/16V

P4451 (TO Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A. P4401)
1 GND
2 Hi-Fi AUDIO L HEAD
3 Hi-Fi AUDIO L/R HEAD
4 Hi-Fi AUDIO R HEAD

109 DELAY REC +12V
10 Hi-Fi PB(H)
8 Hi-Fi HEAD SW
88 AUDIO 2 L CH
99 AUDIO 1 L CH
107 AUDIO 2 R CH
100 AUDIO 1 R CH

TO MAIN I
TO MAIN II
TO MAIN V
TO MAIN II

Z
86 SW +12V
PIN 8 7 6 5 4 3 2 1
SPATIALIZER CTL
AUDIO L CH
GND
AUDIO R CH
SW +12V
AUDIO L CH
GND
AUDIO R CH
(TO SPATIALIZER C.B.A. P4501)

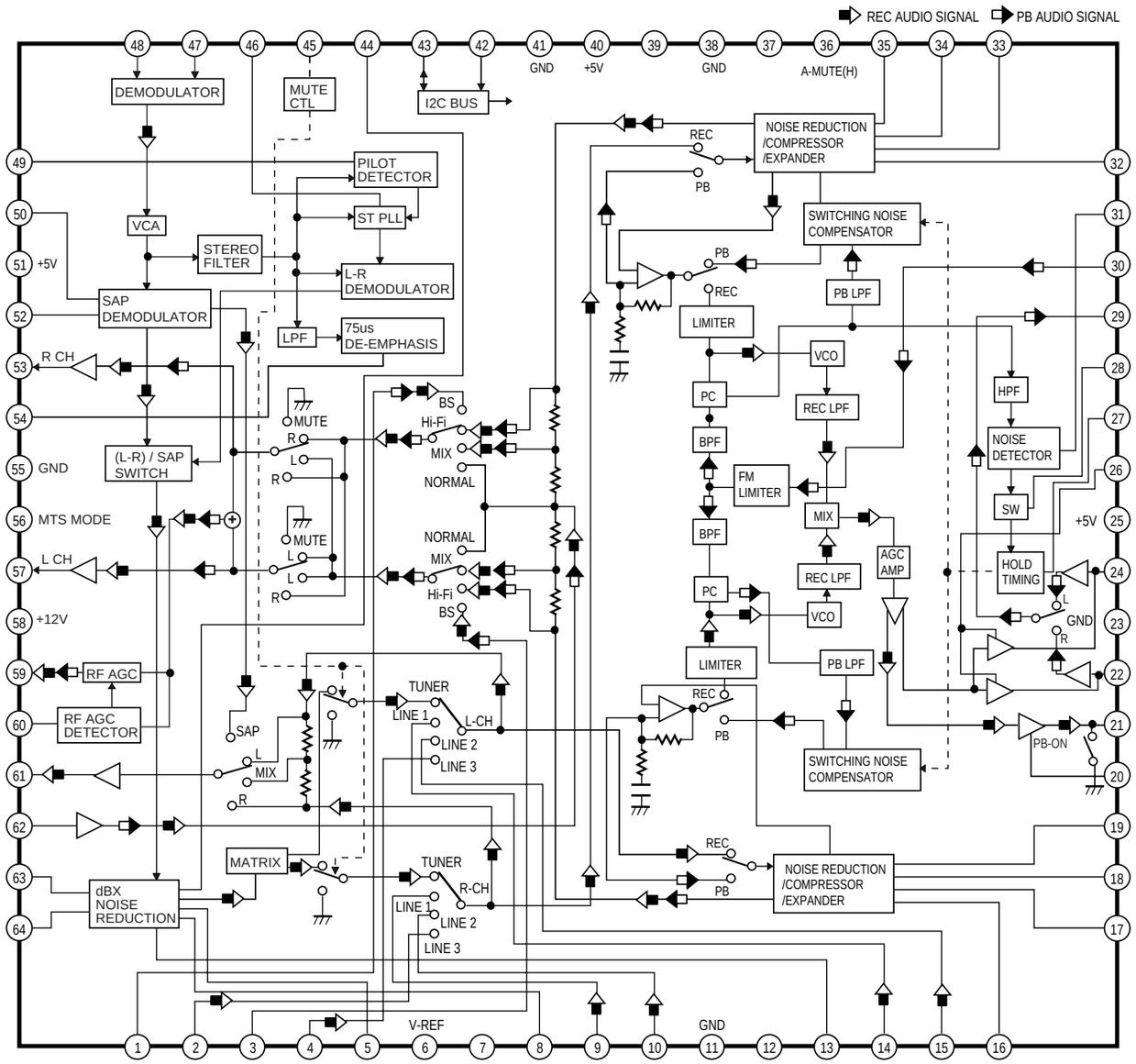
TO MAIN III

UNLESS OTHERWISE SPECIFIED;
WATTAGE OF RESISTORS IS 1/10W.

VJBS6063

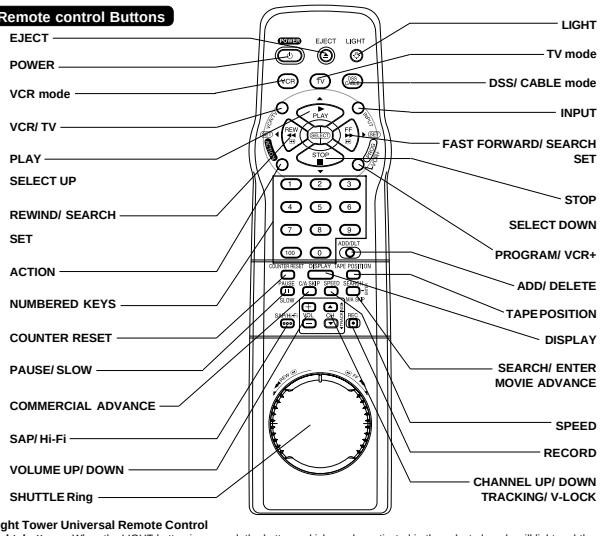
A B C D E F G H I J
6 5 4 3 2 1

IC4201 Hi-Fi AUDIO MTS/SAP PROCESS IC-DETAIL BLOCK DIAGRAM, AN3662FBP



Location of Controls

Remote control Buttons

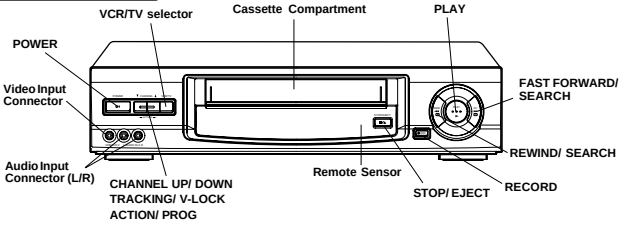


Light Tower Universal Remote Control

Light button: When the LIGHT button is pressed, the buttons which can be activated in the selected mode will light and the selected mode button (TV/VCR or CABLE DSS) will flash for 5 seconds. If no buttons are pressed within 5 seconds, the light will turn off in order to conserve battery power. Also while holding down the buttons, the selected mode button will flash so you will be able to see, in the dark, which mode has been selected.

EJECT button: When EJECT is pressed, the tape is ejected from Cassette Compartment. If EJECT is pressed during recording, the VCR will not respond to the command.

Front View of the VCR



Multi Function Display

Speed Display
Displays the recording speed.

VCR Indicator
Lights when the VCR/TV selector is set to VCR.

Hi-Fi Indicator
Lights when Hi-Fi audio is monitored or playback.

Clock/ Status/ Channel Display/ Prog
Displays the current time. Briefly displays VCR status when a function button is pressed.
Briefly displays the channel number, or "LINE1" or "LINE2" when a channel or line input is selected.
In demonstration mode, featured items are displayed. (See below.)

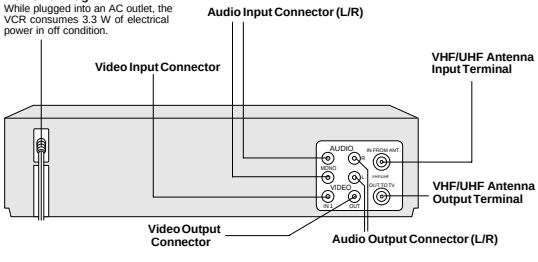
Self Demo Mode

After first power on or VCR memory reset, Self Demo mode is started after 5 seconds.
This mode is cancelled when clock is set.
To restart, hold down PLAY on VCR for 5 seconds.
To cancel, hold down PLAY again for 5 seconds.

• This mode is only possible when cassette is not inserted and clock is not set.

Rear View of the VCR

AC Power Plug
While plugged into an AC outlet, the VCR consumes 3.3 W of electrical power in off condition.



One Time VCR Setup

Please read the instructions carefully and in the order presented.

NOTE: Please look over the information before you begin setup procedure.

Setup Overview
You will be performing the following tasks:

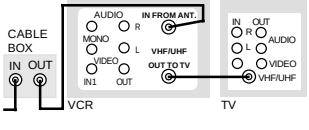
- Setting the language you want on-screen displays to appear in (English, Spanish, French.)
- Telling the VCR what kind of equipment you are using to receive channels and how it is connected.
- Entering pertinent cable box or DSS receiver information if used.
- Entering a local PBS channel so that the VCR can receive auto clock set data. (Not available in all areas.)
- Placing channels in memory and setting the clock.

Please Note Which Connection Type You are Using.

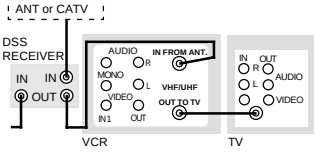
Make sure all equipment is hooked up.
The diagrams below illustrate some of the basic connection types.
Confirm which type you used for later reference.

Connection Type A

<Cable box➡VCR➡TV connection>

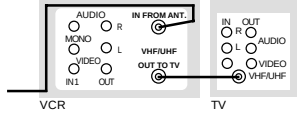


<DSS box➡VCR➡TV connection>

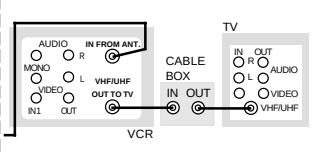


Connection Type B

<VCR➡TV connection>



<VCR➡Cable box➡TV connection>



ONE TIME SETUP IMPORTANT NOTES:

- For detailed DSS receiver connection instruction, please see your DSS operating manual.
- The DSS receiver must be turned off to view programs from the cable box or antenna.
- If you use a DSS receiver, it must be turned off for auto clock set.
- If your cable box is not remote controllable, it must be tuned to your PBS channel.
- If you use Audio/ Video Jack connection between the VCR and cable box or DSS receiver, you must also connect the RF coaxial cable in order to use auto clock set and channel auto set features.

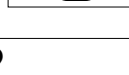
When VCR is turned on the first time.

- Setup mode is entered automatically.
- Self Demo Mode is started automatically on Multi Function Display. When you set the clock, it is cancelled.

Process of Setup

Language ⇨ Cable/DSS Receiver ⇨ Channels ⇨ Clock

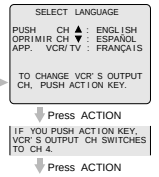
1



Turn the TV and VCR on.
Press POWER.
Set TV Channel to CH 3.

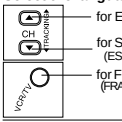
• If using AV Cable connection, set TV to Video instead of channel.

2


SELECT LANGUAGE
PUSH CH ▲: ENGLISH
OPRIMIR CH ▼: ESPAÑOL
APP. VCR/TV : FRANÇAIS
TO CHANGE VCR'S OUTPUT CH, PUSH ACTION KEY.
Press ACTION
IF YOU PUSH ACTION KEY, VCR'S OUTPUT CH SWITCHES TO CH 4.
Press ACTION
PLEASE TUNE YOUR TV TO CH 4.
After 3 seconds

Display SELECT LANGUAGE.
This display appears for first time setup only.

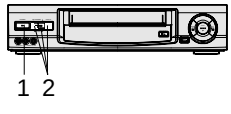
Select the language.

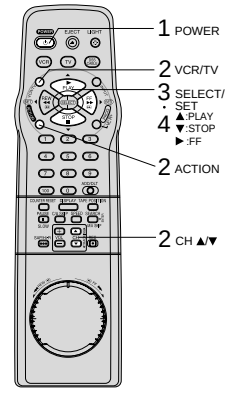


for English
for Spanish (ESPAÑOL)
for French (FRANÇAIS)

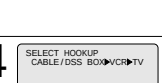
When using connection b), tune TV to VCR's output channel.
If there is beat or noise on CH3, change VCR's output channel to CH4 by pressing ACTION twice.

•Always tune TV to this channel to monitor the VCR.
•If you used audio/video jack connection, tune the TV to its video input.
• If wrong language is set, do "Reset All VCR Memory Functions" steps.

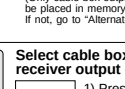




3



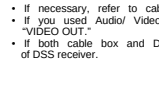
Select hookup.



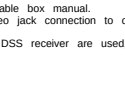
1) Press ▲▼ to select.
2) Press ▶ to set.

•If you selected "CABLE/ DSS BOX ▶ VCR ▶ TV," continue with step 4. (Only cable box output channel will be placed in memory.)
If not, go to "Alternate Instructions".

4



Select cable box or DSS receiver output channel.



1) Press ▲▼ to select.
2) Press ▶ to enter.

- If necessary, refer to cable box manual.
- If you used Audio/ Video jack connection to cable box, set "VIDEO OUT."
- If both cable box and DSS receiver are used, set output channel of DSS receiver.

One Time VCR Setup (continued)

5 **Select Cable box or DSS receiver code.**

1) Press ▲▼ to select.
2) Press ▶ to enter.

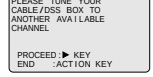
•If cable box or DSS receiver has no remote control, select "NO REMOTE." Then, go to "Alternate Instructions".

•This determines whether VCR will control cable box or DSS receiver.

6 **Select available channel on your Cable box or DSS receiver .**

1) Press ▲▼ to select.
2) Press ▶ to set.

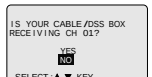
7 **Tune Cable box or DSS receiver channel.**



Press ▶ to continue.

•"NOW TRANSMITTING" appears.

8 **Set receiver channel.**



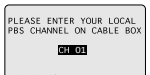
1) Press ▲▼ to select "YES" or "NO."
2) Press ▶ to enter.

If "YES" with cable box, go to step 9.

If "YES" with DSS receiver, go to "Alternate Instructions".

If "NO," the screen in step 5 will appear. Try entering a different code and/ or repositioning the equipment.
If still "NO," cable box or DSS receiver is not available.

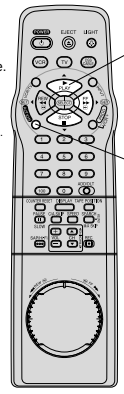
9 **Confirm that cable box is on and that DSS receiver is off.**



Select local PBS channel on cable box.

1) Press ▲▼ to select.
2) Press ▶ to set.

Continued on the right...



10 **Start Clock Auto Set.**

Press CH▲.

• "AUTO CLOCK SET PROCEEDING" appears.

11 **Confirm that time is correct.**

Press CH▲ to exit.

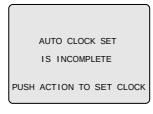
If displayed time is incorrect...

If your area observes DST (daylight saving time), but the time is incorrect; do "Time Zone Adjust" steps.

Or, if you use cable box and receive more than one PBS station, try auto clock set again entering the one you have not tried yet (See "Clock".)

If the screen below appears...

Auto clock set data is not available in your area.
Press ACTION to display Manual Clock Set screen, and then do steps b) ~ d) on next section.



To Setup VCR in Case a Cable Box or DSS Receiver was Installed or Replaced.

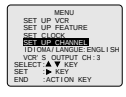
a Press ACTION to display Menu.

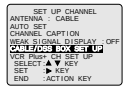
b Press ▲▼ to select "SET UP CHANNEL," then press ▶.

c Press ▲▼ to select "CABLE/ DSS BOX SET UP," then press ▶.

d Press ▲▼ to select "CABLE/ DSS BOX ▶ VCR ▶ TV," then press ▶ to set.

e Continue with steps 4~8 on previous section.



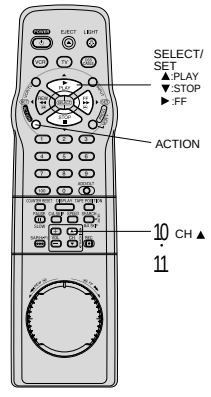


Note

Auto clock set will be performed when VCR is turned off the first time each day.
Therefore, cable box must be left on and tuned to PBS channel before VCR power is turned off.

Process of Setup

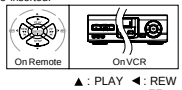
Language ⇨ Cable/DSS Receiver ⇨ Channels ⇨ Clock



Using ▲▼◀▶ keys

You can also operate the menu screen using VCR buttons.

When menu screens are displayed, the PLAY, STOP, REWIND, and FF buttons on the VCR and remote function as ▲▼◀▶ only with no tape inserted.



▲ : PLAY ◀ : REW
▼ : STOP ▶ : FF

To display menu using VCR buttons, press CH ▲ and CH ▼ together.

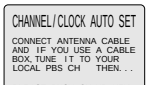
To exit the menu, repeat above.

One Time VCR Setup (continued)

Alternate Instructions

Complete steps below if any of the following applies:
- Selected connection type B (VCR ▶ CABLE/DSS BOX ▶ TV or VCR ▶ TV).
- Selected "NO REMOTE".
- Selected "YES" with DSS receiver. (Be sure to turn DSS power off.)

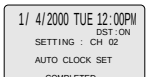
1 **Start Channel Auto Set and Clock Auto Set.**


CHANNEL/CLOCK AUTO SET
CONNECT ANTENNA CABLE
AND IF YOU USE A CABLE
BOX,TUNE IT TO YOUR
LOCAL PBS CH THEN...
PLEASE PUSH CH UP KEY

Press CH▲.

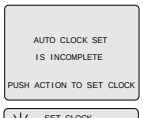
• The following messages appear.
"CH AUTO SET PROCEEDING"
"AUTO CLOCK SET PROCEEDING"

2 **Confirm that time is correct.**



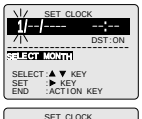
Press CH▲ to exit.

Clock Setup incomplete...



Set the clock manually.

a) Press ACTION.



b) Press ▲▼ to select month.

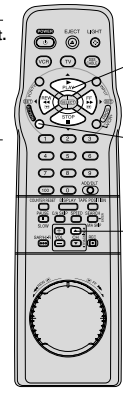
c) Press ▶ to set.

• Likewise, set date, year, time, DST (Daylight Saving Time).

To Make Corrections, repeatedly press ◀ ▶ to move to error, then correct.

d) Press ACTION. (Clock starts.)

• To exit this mode, press ACTION again.



Note

If you use a DSS receiver, it must be turned off.

If displayed time and DST are incorrect...

If you use cable box and receive more than one PBS station, try auto clock set again entering the one you have not tried yet. (See "Clock".)

If you happen to live close to two time zones, VCR may have recognized PBS channel (setting channel) in the wrong time zone. Please do the following to correct the situation.

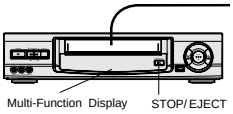
1)Make a note of SETTING : CH number shown on screen and press CH ▲ to exit.
2)Delete the channel from VCR memory. (See "Add or Delete a Channel".)
3)Press ACTION to display the menu.
4)Press ▲▼ to select "SET CLOCK," and then press ▶ to display the SET CLOCK screen.
5)Press ▲▼ and ▶ to select and set "AUTO CLOCK SET."
6)Follow One Time VCR Setup instructions.

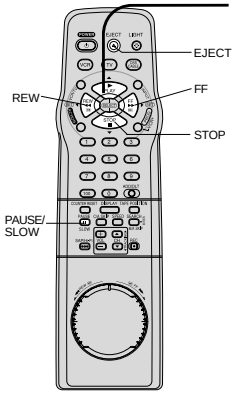
• If you use cable box and have multiple PBS stations, tune cable box to a different PBS station and try auto clock set using the menu.

Playback a Tape

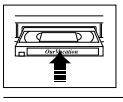
Check list before you begin.

- ☐ All connections are made.
- ☐ TV and VCR are plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on TV.
- ☐ Remote is in VCR mode.





1 **Insert a cassette.**



• VCR power comes on and "VCR" appears on Multi-Function Display.

2 **Press PLAY.**

• Or, if cassette has no record tab, auto playback begins.

■ To Find a Particular Scene
Forward Search --> Press FF. (To release, press PLAY or FF.)
Reverse Search --> Press REW. (To release, press PLAY or REW.)

■ For Still (Freeze) picture --> Press PAUSE/SLOW. (To release, press PLAY.)

■ For Frame by Frame picture --> Press PAUSE/SLOW in Still mode. (To release, press PLAY.)

■ For Slow Motion --> Press and hold PAUSE/SLOW in Still mode. (To release, press PLAY.)

Notes

- These features work best in SP or SLP mode.
- The sound will be muted.
- To reduce picture noise, see "Manual Tracking Control".
- After the VCR is in Still or Slow mode for 3 minutes, it will switch to Stop mode automatically to protect the tape and the video head.

■ **To stop -->** Press STOP.

Rapid Rewind/ FF

■ **To rewind tape -->** Press REW in Stop mode.

■ **To fast forward tape -->** Press FF in Stop mode.

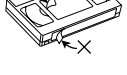
• Rewinds your tape in approximately one minute when using a T-120 tape.

■ **To eject tape -->** Press EJECT on the remote or STOP/ EJECT on the VCR.

Note

● **To prevent tape jam**

Inspect your cassette tapes and remove any loose or peeling labels.



Playback using VCR controls

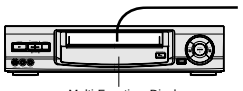
1 Insert a cassette. 2 Press PLAY.

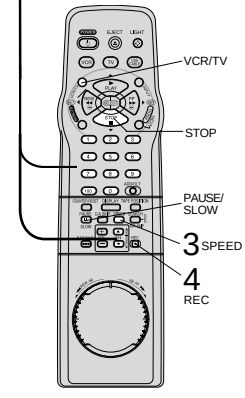
■ Press to stop and/ or eject tape.

Record On a Tape

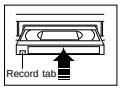
Check list before you begin.

- ☐ All connections are made.
- ☐ TV is turned on and tuned to CH3, 4 or Video.
- ☐ Cassette record tab is in place.
- ☐ Remote in VCR mode.



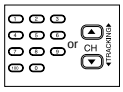


1 Insert a cassette.



- VCR power comes on and "VCR" appears on Multi-Function Display.

2 Select Channel.



Press CH ▲ / ▼ or NUMBERED keys.

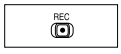
- To select channels 100 or greater first press 100 key, then enter remaining two digits.

3 Select Recording speed.

Press SPEED.

- SP = Standard Play
  LP = Long Play
  SLP = Super Long Play
- Selected speed is displayed on TV screen and Multi-Function Display.

4 Start Recording.



Press REC.

- To edit out unwanted portions, press PAUSE/SLOW to pause and to resume recording.

■ **To stop -->** Press STOP.

■ **One Touch Recording**
Press REC repeatedly to set the recording length (30 min. ~ 4 hours).

- The VCR turns itself off at a preset time.

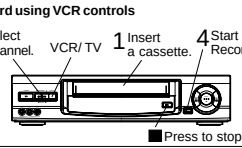
■ **Record One Program While Watching Another**
Press VCR/TV--> "VCR" disappears on Multi-Function Display --> Select Channel at the TV.

■ **Selecting Channel at the VCR**
Press VCR/TV--> "VCR" appears on Multi-Function Display --> Select Channel at the VCR (applies to connection b) only).

Note
After the VCR has been in Pause mode for 5 minutes, it will stop automatically to protect the tape and the video head.

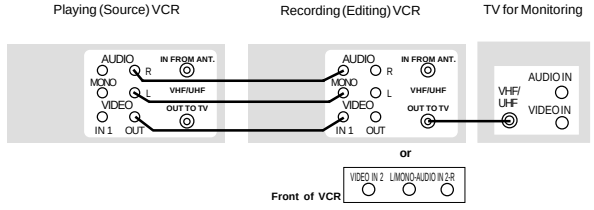
This video recorder, equipped with the HQ (High Quality) System, is compatible with existing VHS equipment. Only use those tapes with the VHS mark. It is recommended that only cassette tapes that have been tested and inspected for use in 2, 4, 6, and 8 hour VCR machines be used.

Record using VCR controls



Copying Your Tapes (Dubbing)

Connections you'll need to make.



Playing (Source) VCR	Recording (Editing) VCR
1 Insert pre-recorded tape.	**1** Insert blank tape with record tab.
2 ———	**2** Select LINE mode. Press INPUT. (See "Selecting the Input Mode" below.)
3 Put in Standby mode. Press PLAY, then PAUSE/SLOW at starting point.	**3** Put in Standby mode. Press REC, then PAUSE/SLOW immediately.
4 Start dubbing. Press PLAY.	**4** Start dubbing. Press PAUSE/SLOW.
5 Stop dubbing. Press STOP.	**5** Stop dubbing. Press STOP.

■ **To Monitor Dubbing on Your TV**

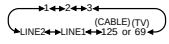
1 Turn your TV on and tune to the Recording VCR channel (CH3 or CH4).

2 Set the VCR/ TV Selector on the Recording VCR to "VCR."

Note Dubbing tapes protected with Copy Guard will have poor quality results.

■ **Selecting the Input Mode**

Method 1: Press INPUT.
Channel Number <--> LINE1 <--> LINE2
Method 2: Press CH ▲/▼. Display will change as below.



- "L1" or "L2" lights on Multi-Function Display (about 4 sec.) when LINE1 or LINE2 is selected.
- LINE1: For rear audio/video connection.
  LINE2: For front audio/video connection.

Caution: **Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.**

Timer Recording Using VCR Plus+® System

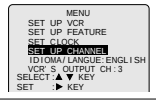
Auto VCR Plus+ System Channel Setup (Part 1)

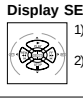
In order for VCR to read PlusCode, some set up is required. Guide (PlusCode) channel number is assigned to each local broadcast and cable station. Because this number sometimes differs from channel TV receives station on, it is necessary to program the VCR with local channel information. To receive VCR Plus+ channels automatically, perform the steps below. Or, see "Manual VCR Plus+ System Channel Setup" section.

1 Display MENU.

Press ACTION.*

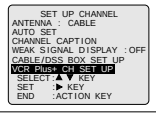
2 Display SET UP CHANNEL.

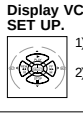




1) Press ▲▼ to select.
2) Press ▶ to display.

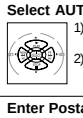
3 Display VCR Plus+ CH SET UP.





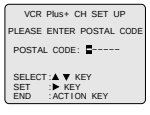
1) Press ▲▼ to select.
2) Press ▶ to display.

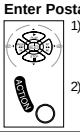
4 Select AUTO SET.



1) Press ▲▼ to select.
2) Press ▶ to set.

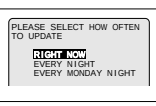
5 Enter Postal Code.

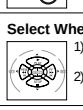




1) Press ▲▼◀▶ to select and enter each number.
2) Press ▶ or ACTION to set.

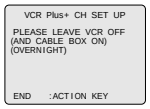
6 Select When to Update.





1) Press ▲▼ to select.
2) Press ▶ to set.

7 End setup.



Press ACTION.

- Make sure to leave VCR off (overnight.) If controllable, leave your cable box on.

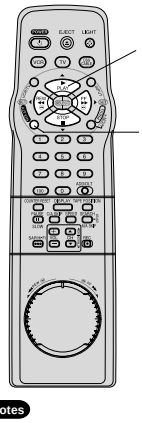
VCR Plus+ System is ...
a feature that allows you to set **most items** of a timer recording by simply entering a special code number (PlusCode programming number) found in TV GUIDE and selected newspaper TV listings.

Process of Recording

Setup ⇨ Programming

Important Note

- **"One Time VCR Setup" must be completed before "Auto VCR Plus+ System Channel Setup" can be done. If any part of setup is incomplete, a warning screen appears.**
- **If your VCR connection type changes from type A to B, perform "To Setup VCR in Case a Cable Box or DSS Receiver was Installed or Replaced" section before proceeding with these steps.**
- **Complete this page only if type B connection is used.**



Notes

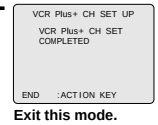
- Make each entry within 5 minutes or VCR will leave this mode.
- Once local channels have been programmed, they will stay in memory, even in the case of a power failure.
- "ALL SET" will flash on Multi-Function Display during Auto VCR Plus+ System Setup.
- If the start time for a timer recording comes up during Auto VCR Plus+ System Setup, the timer recording will have priority.

Auto VCR Plus+ System Channel Setup (Part 2)

Before you perform the following steps, you should have:

- **completed "Auto VCR Plus+ System Channel Setup (Part 1)".**
- **left VCR off overnight, and turned it back on after 9:00 AM the next day.**

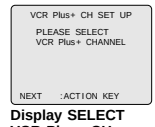
1 If channel updating was successful...



Exit this mode.

Press ACTION.

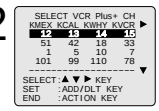
If VCR could not distinguish channel map...



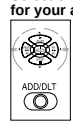
Display SELECT VCR Plus+ CH.

1) Press ACTION to display.
2) Continue with step 2.

2

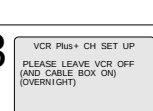


Select channel map for your area.

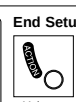


1) Press ▲▼◀▶ to select.
2) Press ADD/DLT to set.

3



End Setup.



Press ACTION.

- Make sure to leave VCR off (overnight.) If controllable, leave your cable box on.

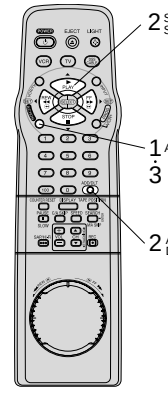
Channel map will be updated overnight.
If it was successful, "VCR Plus+ CH SET COMPLETED" appears on screen. And then, press ACTION to exit.

Repeat these steps as necessary.

If Auto Setup fails, do "Manual VCR Plus+ System Channel Setup".

Process of Recording

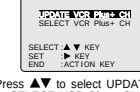
Setup ⇨ Programming



To Change or Update Auto VCR Plus+ System Channel Setup

(E.g. you selected wrong channel map or postal code channel.)

a Do "Auto VCR Plus+ System Channel Setup (Part 1)" steps 1~4.



b Press ▲▼ to select UPDATE VCR Plus+ or SELECT VCR Plus+ CH, then press ▶.

c If you selected UPDATE VCR Plus+ CH, perform steps 5~7 in the "Auto VCR Plus+ System Channel Setup (Part 1)" section.

If you selected SELECT VCR Plus+ CH, perform steps 2~3 in the "Auto VCR Plus+ System Channel Setup (Part 2)" section on this page.

Timer Recording Using VCR Plus+® System (continued)

Manual VCR Plus+ System Channel Setup

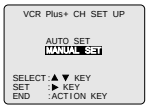
- **Before you begin, complete "Channel Setup Preparations" below right.**

Important Note

- **If your VCR connection type changes from type A to B, perform "To Setup VCR in Case a Cable Box or DSS Receiver was Installed or Replaced" section before proceeding with these steps.**

1 **Do "Auto VCR Plus+ System Channel Setup (Part 1)," steps 1~3.**

2

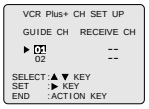


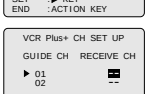
Select MANUAL SET.

1) Press ▲▼ to select.
2) Press ▶ to set.

IMPORTANT NOTE:
For step 3, use the list you prepared. You may leave lines blank if you don't receive that station, or if the GUIDE CH number and the RECEIVE CH numbers are the same.

3





Select VCR Plus+ channels.

1) Press ▶ to move cursor to right column.
2) Press ▲▼ to change RECEIVE CH number.
3) Press ◀ to set.
4) Press ▲▼ to scroll up/down GUIDE CH column.

- Repeat step 3 until list is complete.

To make corrections,
Press ▲▼ and ▶ to move to error, then ▲▼ to change, or ADD/DLT* to erase number.

4

End setup.
Press ACTION three times.

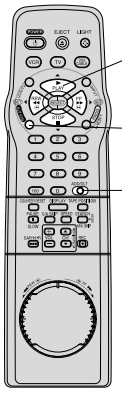
Notes

- Make each entry within 5 minutes or the VCR will exit this mode.
- Once local channels have been programmed, they will stay in memory, even in the case of a power failure.

VCR Plus+, C³, ALLSET, and PlusCode are trademarks of Gemstar Development Corporation. The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

Process of Recording

Setup ⇨ Programming



Channel Setup Preparations

In order to complete step 3 left, make a local channel list (see example below).

You will need the following:
- A line up of normal TV and/ or Cable or DSS (when DSS receiver is connected only.) stations and the channel number you receive them on.
- A list of Guide (PlusCode) channel numbers for the stations you receive found in TV Guide and selected newspapers.

1 Make a 3-column chart. In the left column, write the name of all the stations you receive.

2 In the middle column, write each station's Guide (PlusCode) number from TV Guide.

3 In the right column, write the channel number your TV receives the station on.

EXAMPLE ONLY

Broadcast or Cable Station Name	Assigned Guide (PlusCode) channel no.	Channel no. your TV receives the station on
HBO	33	15
Nickelodeon	38	20
CBS	04	04
FOX	11	

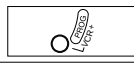
Check list before you begin.
- ☐ The clock is set.
- ☐ VCR Plus+ System Setup is complete.

Process of Recording

Setup ⇨ Programming

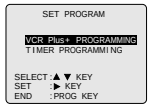
VCR Plus+ System Programming

1



Display SET PROGRAMMING.
Press PROG/ VCR+.*

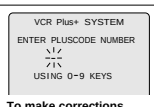
2



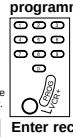
Display VCR Plus+ screen.

1) Press ▲▼ to select.
2) Press ▶ to display.

3

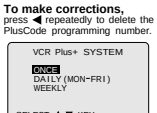


Enter PlusCode programming number.



1) Press Numbered keys.
2) Press PROG/ VCR+ to lock in the program.

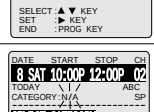
To make corrections,
press ◀ repeatedly to delete the PlusCode programming number.



Enter record frequency.

1) Press ▲▼ to select program type.
2) Press ▶ to set.

4



Select Category.**

1) Press ▲▼ to change.
2) Press ▶ to set.

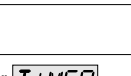
Change record speed.
Repeat 1) and 2).

5 **Make notes.**
- If not wanted, go to step 6.

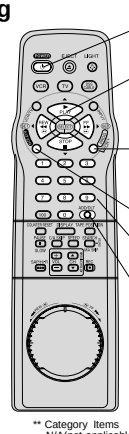
6 **End programming.**

7

Set timer.
Press POWER off.



Multi-Function Display



** Category Items
N/A(not applicable), SPORTS, MOVIE, COMEDY, MUSIC, DRAMA

Use normal Timer Recording steps if:
- the PlusCode programming number for a program is not listed.
- you anticipate the program, such as a sporting event, to run over the scheduled stop time.

Important notes for DSS/Cable Box users
- When recording via DSS, the receiver, must be left on.
- When recording via cable or antenna, DSS receiver must be off.

Note
- Avoid overlapping program times.

Tape Operation

COMMERCIAL▸▸ADVANCE®

COMMERCIAL▸▸ADVANCE® detects and marks the beginning and end points of commercials on your tape for recordings over 15 minutes in length. When a COMMERCIAL▸▸ADVANCE® marked tape is played back, the VCR automatically advances through the commercial segments at high speed. You can also set this feature to Manual so as to have more control over the advance process. The effectiveness of this system can vary due to

Check list before you begin.
- ☐ All connections are made.
- ☐ One time Setup has been completed.
- ☐ VCR is plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on the TV.

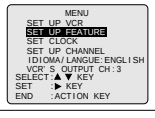
COMMERCIAL▸▸ADVANCE® Marking

When C/A RECORD is selected, the VCR automatically rewinds the tape after a recording has been made and marks the beginning and end of any detected commercial blocks. After marking is done, the tape is returned to the end of the recording. Commercials are not erased from the tape.

1

Display MENU.
Press ACTION.*

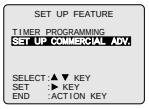
2



Display SET UP FEATURE.

1) Press ▲▼ to select.
2) Press ▶ to display.

3

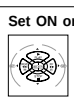


Display SET UP COMMERCIAL ADV.

1) Press ▲▼ to select.
2) Press ▶ to display.

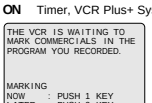
4

Set ON or OFF.



1) Press ▲▼ to select.
2) Press ▶ to set.

ON Timer, VCR Plus+ System, and One Touch recordings are marked automatically.

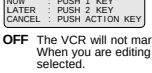

THE VCR IS WAITING TO MARK COMMERCIALS IN THE PROGRAM YOU RECORDED.
MARKING
NOW : PUSH 1 KEY
LATER : PUSH 2 KEY
CANCEL : PUSH ACTION KEY

When STOP is pressed during normal recording, select a) or b) or c).
a) Press 1 key to mark the recording now.
"NOW MARKING COMMERCIALS" appears.
b) Press 2 key to mark the recording later (after the power has been turned off).
- If the tape is rewound and another recording is started before the power is turned off, commercials may not be marked correctly.

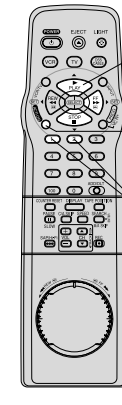
c) Press ACTION to cancel the marking of this recording.

OFF The VCR will not mark commercials.
When you are editing or dubbing a tape, or when you do not wish to use this feature, OFF should be selected.

5



Return to normal screen.
Press ACTION three times.

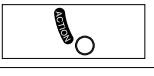


Note
- When using the timer to record two adjacent shows on the same channel, better accuracy can be obtained by programming each show separately.

COMMERCIAL▸▸ADVANCE® Playback

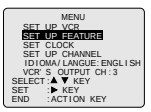
When playing back recordings which have been marked using COMMERCIAL▸▸ADVANCE® feature, you can either set the VCR to automatically advance through marked commercial blocks, or set it so that commercials are only skipped on your command.

1



Display MENU.
Press ACTION.*

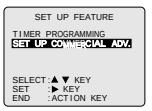
2



Display SET UP FEATURE.

1) Press ▲▼ to select.
2) Press ▶ to set.

3



Display SET UP COMMERCIAL ADV.

1) Press ▲▼ to select.
2) Press ▶ to set.

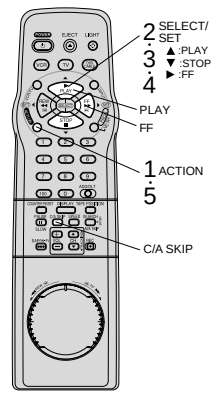
4

Set AUTO or MANUAL.

1) Press ▲▼ to select.
2) Press ▶ to set.

AUTO VCR will automatically advance through marked commercial blocks recorded on the tape and then resume playback.

MANUAL VCR will advance through commercials only when C/A SKIP is pressed. Playback will resume when the end mark of a commercial block is found, or a new recording or blank portion is detected, or after 8 minutes.



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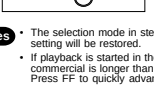
A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc.
U.S.Pat. No. 5,333,091; 5,692,093; 5,696,866 other patents pending

5



Return to normal screen.
Press ACTION three times.

Notes
- The selection mode in step 4 remains set unless there is a power outage in which case the original factory setting will be restored.
- If playback is started in the middle of a commercial, only a single commercial is shown, or an individual commercial is longer than 1 minute, a commercial may not be skipped. Press FF to quickly advance through the commercial.
- Part of a recorded program may be skipped over if the program portion between commercials is less than one minute or there are frequent dark and quiet scenes during the program. To view the portion of tape being incorrectly skipped, press PLAY while the VCR is skipping, reverse the tape to a point just prior to where the skipping began and press PLAY again. This time the group will not be automatically skipped. Automatic skipping will be re-enabled when the end of the marked group is detected.

Tape Operation (continued)

The most commonly asked questions about COMMERCIAL ADVANCE® are answered below.

Question	Answer
How fast does the VCR advance through commercials?	The VCR advances through a 3-minute commercial block in about 8 to 12 seconds if the tape speed is SLP. In SP, it takes about 25 to 35 seconds.
Are commercials advanced through only when I play back a recording?	Yes. The commercials are not marked until after the recording is finished.
Are commercials still recorded on the tape in case I choose to view them sometime?	Yes. By setting the C/A PLAYBACK to MANUAL, see previous section, you can view or advance through commercials as desired.
Does COMMERCIAL ADVANCE® work in all recording speeds?	Yes. COMMERCIAL ADVANCE® works in SP, LP, and SLP.
Does the VCR advance through commercials each time I play back tapes which were recorded using COMMERCIAL ADVANCE®?	Yes. As long as C/A PLAYBACK is set to AUTO, see previous section, the VCR should advance through commercials each time the tape is played back.
After marking commercials, does the VCR stop at the end of the tape, or rewind to the beginning?	The tape stops at the end of the recording so that any additional timer recordings can be performed.
Can I play my COMMERCIAL ADVANCE® recordings in non-COMMERCIAL ADVANCE® VCRs?	Yes. COMMERCIAL ADVANCE® marked recordings will play in non-COMMERCIAL ADVANCE® VCRs, but commercials will not be advanced through.
Does the marking process interfere with other programmed recordings?	No. If the interval between 2 or more timer programs is not sufficient to mark the recording, marking will be done after all recordings are complete and the power goes off.
What happens if I cancel the marking in progress so I can use the VCR?	Marking will be resumed when the VCR's power is turned off as long as the tape has not been ejected.
What if part of my program is advanced through along with the commercials?	Please see the 3rd note on previous section.

Additional Notes:

- Because of the various ways in which commercials are broadcast, the VCR may not be able to recognize all commercials.
- If a timer recording is scheduled for the middle of the night, please be aware that the VCR will make some noise as it rewinds and fast forwards the tape while marking commercials.

COMMERCIAL ADVANCE® and MOVIE ADVANCE® are registered trademarks of SRT, Inc.
A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc.

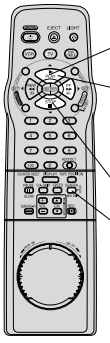
U.S.Pat. No. 5,333,091;
5,692,093; 5,696,866
other patents pending

MOVIE ADVANCE®

MOVIE ADVANCE® helps you locate certain parts of pre-recorded movies (rented or purchased).
The feature works in two ways.
- You can go to the beginning of the movie.
- You can skip from one preview to the next.

MOVIE ADVANCE® works only on cassettes recorded in SP speed with the record tab removed.

Check list before you begin.
- ☐ All connections are made.
- ☐ One time Setup has been completed.
- ☐ VCR is plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on the TV.



1 **Insert a cassette without a record tab.**

2 SEARCH M/A SKIP — **Display "SELECT SEARCH MODE."**
1) Press SEARCH/ M/A SKIP.*

3 **Display MOVIE ADVANCE.**

```
SELECT SEARCH MODE

INDEX SEARCH
PROGRAM END SEARCH
MOVIE ADVANCE

SELECT:▲▼ KEY
SET   :▶ KEY
END   :SEARCH M/A SKIP
```

1) Press ▲▼ to select.
2) Press ▶ to set.

4 **Select "GO TO START OF MOVIE" or "GO TO PREVIEW".**

```
MOVIE ADVANCE
SELECT SEARCH MODE
GO TO START OF MOVIE
GO TO PREVIEW

SELECT:▲▼ KEY
SET   :▶ KEY
END   :SEARCH M/A SKIP
```

Press ▲▼ to select.

Select "GO TO START OF MOVIE," if you want to advance directly to the beginning of the movie.
--> continue with step 5.
Select "GO TO PREVIEW," if you want to view the first (next) preview.
--> go to "To Search for Preview" at right.

5 **Start searching.**

```
MOVIE ADVANCE
SEARCHING FOR START
OF MOVIE
CANCEL:STOP KEY
```

Press ▶.
• To cancel, press STOP.

When the movie is found...

6 **Start playback.**

```
MOVIE ADVANCE
THE MOVIE IS READY.
PUSH PLAY TO START
CANCEL:STOP KEY
```

Press PLAY.
• To cancel, press STOP.
• The display disappears after 3 minutes and the VCR will enter the Stop mode..

To Search for Preview.

You can override the operation of MOVIE ADVANCE® SEARCH FOR PREVIEWS mode by pressing SEARCH/ M/A SKIP during tape searching. MOVIE ADVANCE® works by searching the tape past each preview and then reversing back to the start of the detected preview. While the tape is reversing back, if SEARCH/ M/A SKIP is pressed, MOVIE ADVANCE® will begin searching for the next preview. While searching for the next preview, if you see the start of a preview which you wish to watch, press SEARCH/ M/A SKIP and MOVIE ADVANCE® will immediately reverse back to the start of that preview, instead of searching further past the preview start point.
Once the VCR is playing a preview, press SEARCH/ M/A SKIP to advance to the next preview, long commercial or the start of the movie (whichever is next).

a **Start preview searching.**
1) In step 4 at left, select Go To PREVIEW.
2) Press ▶.
• If you want to playback, press PLAY.

When a preview is detected, the VCR will start playback.

b SEARCH M/A SKIP — **Start the next preview search.**
Press SEARCH/ M/A SKIP.
• To cancel, press STOP.

Tape Operation (continued)

Search System

Each time a recording is made, an invisible index mark is placed on the tape. When timer recordings are made, program index and information are also included. These index marks can be used to access or scan recordings.

Program End Search

It is easy to locate the end of a recorded program allowing you to continue recording where you left off.

1 SEARCH M/A SKIP — **Display SELECT SEARCH MODE** in Stop or Play mode.
Press SEARCH/ M/A SKIP.*

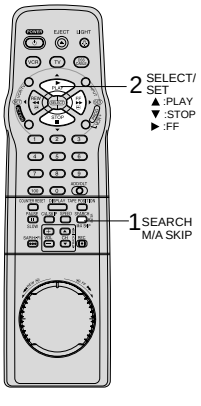
2 **Select PROGRAM END SEARCH.**

```
SELECT SEARCH MODE

ZERO SEARCH
INDEX SEARCH
PROGRAM END SEARCH
PROGRAM INDEX SEARCH

SELECT:▲▼ KEY
SET   :▶ KEY
END   :SEARCH M/A SKIP
```

1) Press ▲▼ to select.
2) Press ▶ to start search.



Examples of **Program End Search** operation.

Fig.1

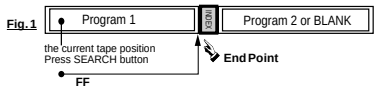


Fig.2

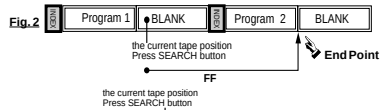
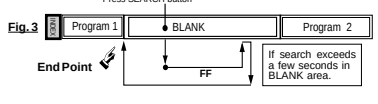
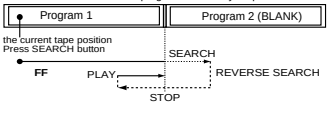


Fig.3



If Program End Point ( ) is found.

The search continues slightly beyond the end point, then search and reverse search and plays the last few seconds of the program and finally stops.



Notes
- If Program End Search is started very close to an index mark, one program may be skipped over.
- To cancel Program End Search, press PLAY or STOP.

Program Index Search (For timer recordings only)

Choose a timer recorded program from a Program Index List. **When the tape is ejected or normal recording is started, all program index data is deleted.**

1 SEARCH M/A SKIP — **Display SELECT SEARCH MODE** in Stop or Play mode.
Press SEARCH/ M/A SKIP.*

2 **Display PROGRAM INDEX.**

```
SELECT SEARCH MODE

ZERO SEARCH
INDEX SEARCH
PROGRAM END SEARCH
PROGRAM INDEX SEARCH
```

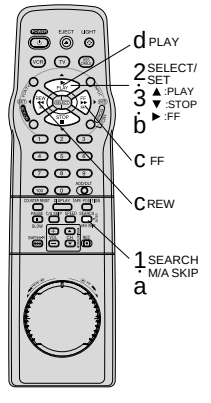
1) Press ▲▼ to select.
2) Press ▶ to display.

3 **Select the desired recorded program.**

```
PROGRAM INDEX
DATE  START CATEGORY  CH
12/26 10:00A SPORTS ABC
 1/ 4 12:30P MOVIE    NBC
 1/ 4  8:00P COMEDY   CBC
 1/ 7  3:00P MUSIC    NBC

SELECT:▲▼ KEY
SEARCH:▶ KEY
END   :SEARCH M/A SKIP
```

1) Press ▲▼ to select.
2) Press ▶ to start the forward or rewind search.
• When search is finished, playback begins.



Index Scan (For normal and /or timer recordings)

In Play mode, the first 10 seconds of each recording can be scanned (forward or reverse).

a SEARCH M/A SKIP — **Display SELECT SEARCH MODE** in Stop or Play mode.
Press SEARCH/ M/A SKIP.*

b **Select INDEX SEARCH.**

```
SELECT SEARCH MODE

ZERO SEARCH
INDEX SEARCH
PROGRAM END SEARCH
PROGRAM INDEX SEARCH

SELECT:▲▼ KEY
SET   :▶ KEY
END   :SEARCH M/A SKIP
```

1) Press ▲▼ to select.
2) Press ▶ to display.
• This screen appears only if there are timer recordings.

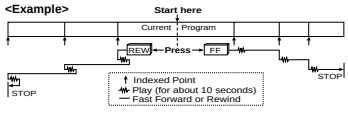
c INDEX — **Start scan.**
Press FF or REW.

d **Cancel scan, start playback.**

```
AUTO INDEX SEARCH
```

Press PLAY.
• To stop, press STOP.

<Example> Start here



Auto Operation Functions

■ Auto Playback
Insert tape --> Power turns on --> --> Starts playback if record tab is removed.

■ Auto Rewind
Playback
Manual Record --> Tape end --> Fast Forward
-->Rewinds (Auto)

■ Playback Auto Eject (Repeat Play is "OFF")
Playback --> Tape end --> Rewinds -->Tape ejects (if without record tab)

■ Memory Rewind Off
Rewind --> Press POWER --> -->Turns off after completed

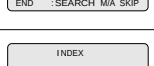
Tape Operation (continued)

Direct Access (For normal and /or timer recordings)

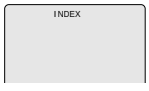
Go directly to desired recording.

1 **Display SELECT SEARCH MODE** in Stop or Play mode.
Press SEARCH/ M/A SKIP.*

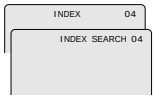
2 **Select INDEX SEARCH.**
1) Press ▲▼ to select.
2) Press ▶ to display.
• This screen appears only if there are timer recordings.

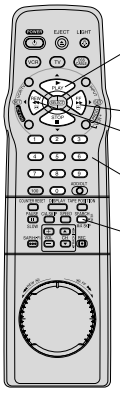


3 **Select the recording number.**
Press NUMBERED keys.
• To calculate number, see below.



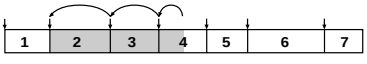
4 **Start search.**
Press FF or REW.
• When search is finished, playback begins.



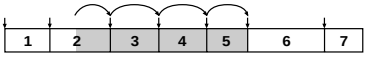


■ To Calculate Index Number

Example 1:
If you are watching recording 4 and you want to watch recording 2, enter 3 in step "3" and press REW.



Example 2:
If you are watching recording 2 and you want to watch recording 6, enter 4 in step "3" and press FF.



NOTE: ↓ indicates start points of each recording.

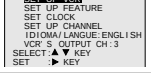
Notes
- Make each entry within 10 seconds, or the Index Search mode will be ancelled.
- If Direct Access or Index Scan is started very close to an index mark, that index mark may not be counted in the search.

Repeat Play

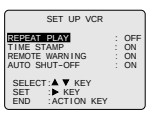
Set to see a recording over and over.

1 **Display MENU.**
Press ACTION.*

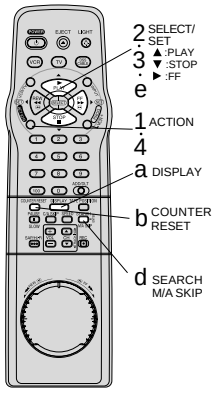
2 **Display SET UP VCR.**
1) Press ▲▼ to select.
2) Press ▶ to display.



3 **Set ON or OFF.**
1) Press ▲▼ to select "REPEAT PLAY."
2) Press ▶ to set.
• Playback repeats when tape end is reached or unrecorded portion over 30 seconds is detected.



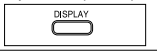
4 **Return to normal screen.**
Press ACTION twice.



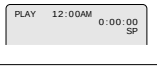
Zero Search

To quickly return to specific tape counter location.

a **Display Counter.**
Press DISPLAY during playback.



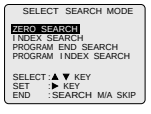
b **Reset to "0:00:00."**
Press COUNTER RESET at the desired position.



c **Continue Recording, playback etc.**

d **Display SELECT SEARCH MODE** in Stop mode.
Press SEARCH/ M/A SKIP.*

e **Start ZERO SEARCH.**
1) Press ▲▼ to select.
2) Press ▶ to display.
• Unit will go into FF or REW mode and stop at the last point the Counter was set to 0:00:00.



Special VCR Features

Channel Caption

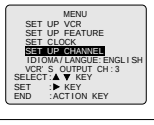
When set, station name, e.g. ABC, CBS, and channel number appear on-screen.
Set up to 24 preset captions, and/or 10 manually created captions.

☐ You need a list of stations and the channel numbers you receive them on.

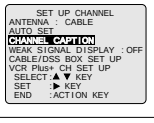
Preset Caption

1 **Display MENU.**
Press ACTION.*

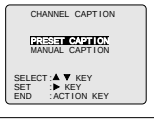
2 **Display SET UP CHANNEL.**
1) Press ▲▼ to select.
2) Press ▶ to display.



3 **Display CHANNEL CAPTION.**
1) Press ▲▼ to select.
2) Press ▶ to display.

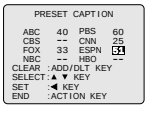


4 **Display PRESET CAPTION.**
1) Press ▲▼ to select.
2) Press ▶ to display.
• To create your own captions, go to "Manual Caption".

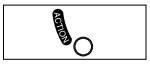


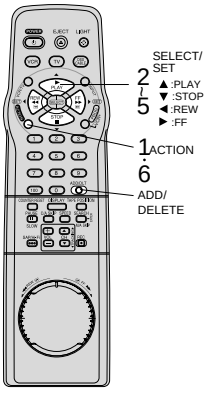
5 **Assign preset captions.**
1) Press ▲▼ to highlight caption.
2) Press ▶ to move cursor to the right.
3) Press ▲▼ to select CH number.
4) Press ◀ to set.
• Repeat step 5 until the list is complete.

To make corrections,
Press ▲▼ and ▶ to select the channel number, then press ▲▼ to change, or ADD/DLT to delete the number.



6 **End setup.**
Press ACTION four times.

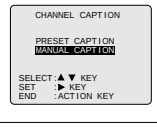




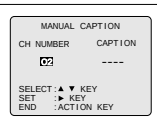
Manual Caption

1 **Do "Preset Caption" steps 1~3.**

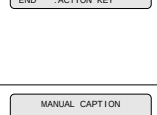
2 **Display MANUAL CAPTION.**
1) Press ▲▼ to select.
2) Press ▶ to display.

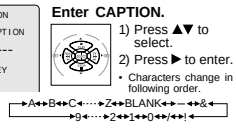


3 **Select channel number.**
1) Press ▲▼ to select CH NUMBER.
2) Press ▶ to move cursor to the right.
• Channels already set and channels deleted from Channel Memory are not displayed.
• You can set a total of ten channel captions.



4 **Enter CAPTION.**
1) Press ▲▼ to select.
2) Press ▶ to enter.
• Characters change in following order.



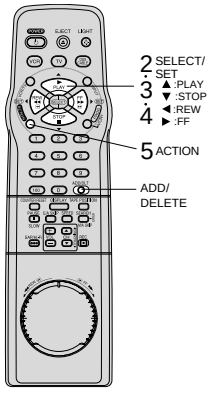


3) Press ◀ to set.

• Repeat steps 3 and 4 as desired.

To make corrections,
Press ◀ ▶ to move to the incorrect entry, then press ▲▼ to make correction. Or, press ADD/DLT to clear the caption.

5 **End input.**
Press ACTION four times.



Special VCR Features (continued)

Time Stamp Feature

The VCR writes program data (see example below) about the first 10 seconds of every recording. The information is then displayed the first 10 seconds of playback. To change the data, see "Changing Time Stamp Data".

Check list before you begin.
- ☐ Clock is set to correct time.
- ☐ Record tab in place.

1 **Display MENU.**
Press ACTION.*

2 **Display SET UP VCR.**
1) Press ▲▼ to select.
2) Press ▶ to display.

```
MENU
SET UP VCR
SET UP FEATURE
SET CLOCK
SET UP CHANNEL
IDIOMA/LANGUE:ENGLISH
VCR'S OUTPUT CH:3
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

3 **Set ON or OFF.**
1) Press ▲▼ to select.
2) Press ▶ to set.

```
SET UP VCR
REPEAT PLAY      : OFF
TIME STAMP       : ON
REMOTE WARNING   : ON
AUTO SHUT-OFF    : ON
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

- When "OFF" is selected, the program data is written on the tape, but will not be displayed.

4 **Return to normal screen.**
Press ACTION twice.

<Time Stamp Example>

One Touch Recording

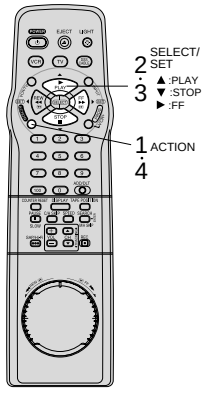
```
12/27/1999 MON
12:00PM
CH 08 ABC
```

Timer Recording

```
12/27/1999 MON
12:00PM - 1:00PM
CH 08 ABC  MOVIE
MEMORIAL MOVIE
```

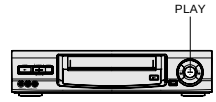
When Clock is not set...

```
--/--/----
--:--
CH 08 ABC
```



Changing Time Stamp Data

You may change the Date, Time, Channel, Category, and Notes.



1 **Display Time Stamp Data.**
1) Insert cassette with record tab.
2) Press PLAY.

2 **Display TIME STAMP EDIT.**

```
12/27/1999 MON
12:00PM - 1:00PM
CH 08 ABC  MOVIE
MEMORIAL MOVIE
```

Press PROG/ VCR+ while the data is displayed in Playback mode.

3 **Change Time Stamp Data.**

```
TIME STAMP EDIT
DATE : 12/27/1999 MON
TIME : 12:00PM - 1:00PM
CH   : 08 ABC
CATEGORY : MOVIE
NOTES :MEMORIAL MOVIE----
SELECT:▲▼ KEY
SET   :◀▶ KEY
END   :PROG KEY
```

1) Press ▲▼ to select.
2) Press ▶ to enter and continue.

- Characters in NOTES will change in the following order.

▶A↔B↔C◀ ····▶Z↔BLANK↔–↔&◀
▶9◀ ····▶2↔1↔0↔/↔!◀

3) Repeat 1) and 2) as needed.

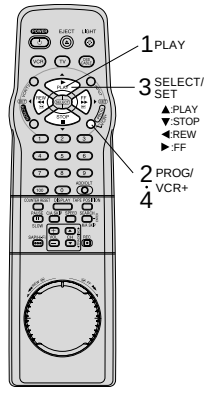
To make corrections,
Press ◀▶ to move to the incorrect entry, then press ▲▼ to make the correction.

4 **Write the new data.**

```
NOW WRITING TIME STAMP
```

Press PROG/ VCR+.

- When data is written, VCR returns to Stop mode.



Special VCR Features (continued)

Tape Position Display Feature

To find out the present tape position.
Tape position cannot be found for C-Cassette type and tape of less than 60 minutes.

Check list before you begin.
- ☐ All connections are made.
- ☐ VCR is plugged in.
- ☐ TV is turned on and tuned to CH3, 4 or Video.

1 **Detect Tape Position.**
Press TAPE POSITION.

```
TAPE POSITION
```

```
DETECTING TAPE POSITION
```

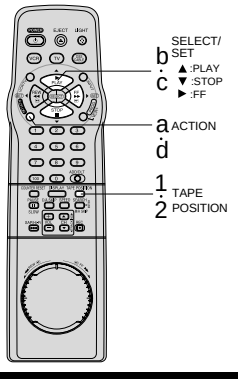
- "DETECTING TAPE POSITION" only appears the first time a cassette is inserted.
- It takes several seconds for correct indication to appear.

```
BEGIN        END
```

- The present tape position indication is displayed.

2 **Return to normal screen.**
Press TAPE POSITION.

```
TAPE POSITION
```



Remote Warning ON/OFF Feature

If Multi-brand feature is used, and this feature is set to on, a warning appears whenever an invalid key is pressed in TV, DSS, or Cable mode.

a **Display MENU.**
Press ACTION.

b **Display SET UP VCR.**
1) Press ▲▼ to select.
2) Press ▶ to display.

```
MENU
SET UP VCR
SET UP FEATURE
SET CLOCK
SET UP CHANNEL
IDIOMA/LANGUE:ENGLISH
VCR'S OUTPUT CH:3
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

c **Set ON or OFF.**
1) Press ▲▼ to select.
2) Press ▶ to set.

```
SET UP VCR
REPEAT PLAY      : OFF
TIME STAMP       : ON
REMOTE WARNING   : ON
AUTO SHUT-OFF    : ON
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

- "OFF" --> remote warning will not appear even if invalid key is pressed.

d **Return to normal screen.**
Press ACTION twice.

VCR Lock Feature

All operations are prohibited except timer recording and tape eject. Useful for families with small children.

A Press REC in Stop mode.

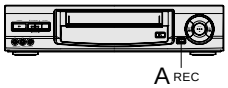
```
VCR LOCK ACTIVATED
```

To turn on:
In Stop mode, hold down REC on the VCR without a cassette inserted for 7 seconds.

```
VCR LOCK OFF
```

To turn off:
Repeat above.

- VCR Lock is cancelled automatically after 24 hours if clock is set.



Weak Signal Display ON/OFF Feature

When "ON" is selected, picture is displayed even when broadcast signal is weak or nonexistent.

1 **Display MENU.**
Press ACTION.*

2 **Display SET UP CHANNEL.**
1) Press ▲▼ to select.
2) Press ▶ to display.

```
MENU
SET UP VCR
SET UP FEATURE
SET CLOCK
SET UP CHANNEL
IDIOMA/LANGUE:ENGLISH
VCR'S OUTPUT CH:3
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

3 **Set ON or OFF.**
1) Press ▲▼ to select.
2) Press ▶ to set.

```
SET UP CHANNEL
ANTENNA : CABLE
AUTO SET
CHANNEL CAPTION
WEAK SIGNAL DISPLAY : OFF
CABLE/DSS BOX SET UP
VCR Plus+ CH SET UP
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

- ON --> Picture is displayed regardless of signal condition, and may not always be clearly visible.
  OFF --> Screen turns solid blue when signal is absent or weak.
- If VCR is connected to equipment which has blue back feature, selecting ON will have no effect on the other equipment.

4 **Return to normal screen.**
Press ACTION twice.

Auto Shut-Off Feature

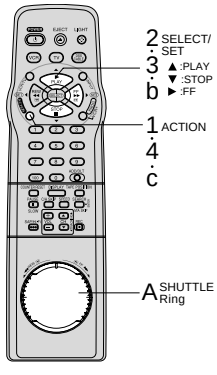
When "ON" is selected, VCR shuts itself off when playback of a blank portion of tape continues or no signal (except when LINE is selected) is detected for over 5 minutes.

a **Repeat step "a" and "b" on previous section to display SET UP VCR.**

b **Set ON or OFF.**
1) Press ▲▼ to select.
2) Press ▶ to set.

```
SET UP VCR
REPEAT PLAY      : OFF
TIME STAMP       : ON
REMOTE WARNING   : ON
AUTO SHUT-OFF    : ON
SELECT:▲▼ KEY
SET   :▶ KEY
END   :ACTION KEY
```

c **Return to normal screen.**
Press ACTION twice.



Shuttle Variable Speed Search

The SHUTTLE Ring allows you to smoothly control the tape speed during special effects playback in both forward or reverse.

A **Place the forward or reverse search.**
Turn SHUTTLE Ring while in Play or Still mode.
- The more you turn the Ring, the faster the search speed will be.

B **Release the Shuttle mode.**
Press a function button such as : PLAY, STOP, etc.
- The VCR performs the function of the button pressed.

Notes
- When the SHUTTLE Ring is turned more than half in Stop mode, normal Fast Forward or Rewind will begin.
- Some noise bars are normal during Shuttle operation.
- After 3 minutes in Still or Slow, the VCR will go into Stop mode.
- When the SHUTTLE Ring is released, the VCR goes into Still mode.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

MAIN C.B.A. (POWER SUPPLY/VIDEO/AUDIO SECTION)

MODE / PIN NO.	REC	PLAY
IC1001		
1	5.3	5.3
2	4.4	4.4
3	0.6	0.6
4	2.0	2.0
IC3001		
1	4.9	4.9
2	3.3	3.3
3	2.0	2.1
4	4.9	4.9
5	4.2	4.2
6	1.8	---
7	5.1	5.1
8	5.2	---
9	2.2	2.2
10	2.7	2.7
11	0.8	0.8
12	2.7	2.7
13	0	0
14	0.3	0.3
15	1.1	1.1
16	3.0	3.6
17	2.3	1.7
18	3.0	3.3
19	2.6	2.6
20	3.0	3.1
21	5.0	5.0
22	2.0	2.0
23	2.4	2.3
24	2.3	2.1
25	2.0	2.0
26	2.4	2.3
27	2.0	1.9
28	0	0
29	1.8	1.8
30	1.8	1.8
31	2.0	2.1
32	2.2	2.3
33	1.9	2.0
34	2.7	2.7
35	2.0	2.2
36	---	2.4
37	16.4	1.4
38	4.4	2.2
39	1.9	1.9
40	2.8	2.9
41	2.7	3.4
42	0	0
43	3.3	3.3
44	---	2.5
45	---	2.5
46	---	2.5
47	5.0	5.0
48	1.1	0
49	1.5	2.6
50	4.0	0
51	5.0	5.0
52	1.2	2.5
53	2.4	2.4
54	1.8	2.4
55	2.0	2.0
56	5.0	4.3
57	2.5	2.5
58	2.5	0
59	2.5	0
60	2.5	0
61	2.5	2.5
62	0	0
63	0	0
64	2.0	2.4
65	2.5	2.6
66	2.5	2.6
67	2.5	2.5
68	5.0	5.1
69	2.6	0
70	0	---
71	2.5	2.5
72	2.5	2.5
73	2.5	2.5
74	0	-0.1
75	0	-0.1
76	3.2	-0.1
77	0	0
78	2.1	2.1
79	2.8	2.9
80	2.1	2.1
81	2.4	2.6
82	---	2.7
83	2.5	2.5
84	2.4	2.3
IC3101		
1	3.0	3.0
2	5.0	5.0
3	0	0
4	3.0	3.0
5	2.9	2.9
6	-2.6	-3.5
7	2.1	2.1
8	3.3	3.5
IC3201		
1	2.9	2.9
2	-2.6	-2.6
3	5.0	5.0
4	0	0
5	2.1	2.1
6	2.1	2.1
7	2.1	2.1
8	3.0	3.0
IC3801		
1	5.0	5.0
2	1.0	0.9
3	2.9	3.0
4	2.9	3.0
5	2.9	2.3
6	---	---
7	3.0	3.0
8	0	0
9	---	---
10	3.0	3.0
11	4.9	4.9
12	1.3	1.3
13	1.3	1.3
14	4.5	4.5
15	1.0	1.0
16	4.7	4.7
17	2.8	2.8
18	0.6	0.6
19	1.8	1.8
20	1.9	2.0
21	3.2	3.2
22	1.7	1.7
23	---	---
24	1.7	1.7
25	4.9	4.9
26	---	---
27	---	---
28	2.9	2.9
29	2.5	2.5
30	3.1	3.1
31	3.0	3.1
32	2.3	2.4
33	2.8	2.8
34	2.9	2.9
35	5.0	5.0
36	0	0
IC4201		
1	2.0	2.3
2	0	0
3	2.4	2.2
4	0	0
5	2.2	2.2
6	2.5	2.4
7	2.0	2.1
8	0.4	0.3
9	0	0
10	0.2	0.2
11	0	0
12	2.0	2.1
13	2.3	2.3
14	0	0
15	2.5	0.2
16	2.5	2.5
17	0.6	0.7
18	2.5	2.5
19	2.5	2.4
20	2.5	0
21	2.5	0
22	2.5	0.7
23	0	0
24	2.5	0.7
25	4.9	5.0
26	2.5	0
27	0	2.6
28	3.8	3.8
29	4.0	1.8
30	1.9	0.9
31	1.1	1.8
32	2.5	2.4
33	2.5	2.4
34	0.7	0.6
35	2.5	2.4
36	0	0
37	1.6	1.8
38	0	0
39	0.1	0.1
40	4.9	4.9
41	0	0
42	5.1	5.1
43	5.2	5.2
44	2.3	2.3
45	5.1	5.1
46	3.6	3.6
47	1.8	1.4
48	2.2	2.2
49	3.6	3.6
50	3.5	3.4
51	5.1	5.1
52	3.5	3.5
53	5.9	-0.1
54	2.3	2.3
55	0	0
56	0.1	0.1
57	5.9	5.8
58	12.1	-0.1
59	5.9	5.8
60	0.6	-0.1
61	2.5	-0.1
62	2.4	-0.1
63	2.3	2.3
64	0.4	0.4
IC6303		
1	-22.9	-22.8
2	---	---
3	---	---
4	-25.9	-26.5
5	-25.1	-26.4
6	-26.5	-26.5
7	-26.4	-26.3
8	-26.4	-26.3
9	-26.4	-26.3
10	-26.4	-26.3
11	---	---
12	-26.3	-26.3
13	-26.5	-26.2
14	-26.5	-26.3
15	-26.4	-26.3
16	-29.7	-29.7
17	---	---
18	5.2	5.2
19	2.5	2.5
20	2.7	2.4
21	0	0
22	4.3	4.2
23	5.1	5.1
24	1.3	0.1
25	---	---
26	---	---
27	---	---
28	---	---
29	---	---
30	---	---
31	-5.2	0
32	-7.6	0
33	-13.3	-10.0
34	-4.0	-10.0
35	-7.1	-4.0
36	-10.	-3.7
37	-10.4	-7.0
38	-16.4	-9.9
39	-29.5	-29.4
40	-29.5	-29.4
41	-29.5	-29.4
42	-29.2	-29.4
43	-29.2	-26.1
44	-26.2	-29.4
Q1001		
E	0	0
C	164.5	164.6
B	0.3	0.3
Q1002		
E	0	0
C	0.3	0.3
B	0.6	0.6
Q1003		
E	0	-0.1
C	4.0	4.1
B	-0.6	-0.6
Q1004		
E	4.1	4.1
C	0	0
B	4.4	4.4
Q1005		
E	4.7	4.7
C	5.2	5.2
B	5.3	5.3
Q1051		
E	12.1	12.0
C	14.3	14.4
B	9.3	9.4
Q1052		
E	0.6	0.5
C	9.1	9.3
B	0	0
Q1053		
E	5.1	5.1
C	5.2	5.2
B	5.9	5.9
Q1080		
E	23.5	23.4
C	13.8	13.8
B	23.5	23.3
Q1081		
E	0	0
C	23.4	23.3
B	-0.1	-0.2
Q1082		
E	14.6	14.6
C	14.5	14.5
B	13.8	13.9
Q1083		
E	0	0
C	0.1	0.1
B	.07	0.7
Q3001		
E	1.9	1.9
C	0	0
B	2.6	2.7
Q3201		
E1	2.3	2.3
C1	0	0
B1	1.6	1.6
E2	1.6	1.6
C2	3.5	3.5
B2	2.3	2.3
Q3202		
E	4.0	0
C	1.9	1.9
B	3.3	3.3
Q3875		
E	2.8	2.8
C	0	0
B	2.0	2.0
Q4001		
E	5.1	4.3
C	-22.0	5.0
B	5.1	5.1
Q4002		
E	-22.0	0.7
C	0	0
B	-13	0
Q4003		
E	-22.0	0.7
C	0	0
B	-13.0	0
Q4004		
E	0	0
C	-4.5	-4.5
B	0	0
Q4005		
E	-4.7	-4.7
C	0	0
B	0	0
Q4006		
E	-4.3	-4.3
C	0	0
B	0	0
Q4007		
E	-4.6	-4.6
C	0	0
B	0	0
Q4101		
E	0.1	0
C	11.6	0
B	0	0
TP1001	0	0
TP1002	32.2	32.3
TP1003	14.3	14.5
TP1004	-29.8	-29.8
TP1005	5.2	5.3
TP1006	5.3	5.3
TP1007	0	0
TP1008	5.2	5.3
TP1009	0	0
TP1050	5.1	5.2
TP1051	5.3	5.3
TP1058	12.1	12.1
TP1080	0	0
TP1081	13.6	13.7
TP3001	2.6	2.7
TP3002	2.7	2.3
TP3003	1.9	2.1
TP3004	4.2	4.3
TP3005	2.5	2.6
TP3006	2.4	2.5
TP3007	1.9	1.6
TP3008	3.3	3.3
TP3009	0	0
TP3010	4.9	5.0
TP3011	0.3	0.4
TP3101	2.9	3.1
TP3102	2.8	3.0
TP3103	1.8	1.9
TP3150	4.1	3.1
TP3151	2.3	2.4
TP3152	2.5	2.6
TP3153	2.5	2.6
TP3154	1.1	1.2
TP3401	0	0
TP3801	0	0
TP3802	0	0
TP3803	0	0
TP3804	0	0
TP3805	5.0	5.1
TP4002	0	0
TP4003	0	0
TP4011	0	0
TP4101	0	0
TP4102	0	0
TP4103	0	0
TP4201	0	0
TP4202	0	0
TP4203	0	0
TP4204	0	0
TP4205	3.9	1.8
TP4206	3.8	3.8
TP4208	0.3	0.4
TP4207	1.9	0.9
TP6303	5.1	5.1
TP6304	5.1	5.1
TP6305	0	---
TP6306	5.1	5.1

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

MAIN C.B.A. (SYSTEM CONTROL/SERVO SECTION)

MODE / PIN NO.	REC	PLAY	STOP
IC2601			
1	13.8	13.8	14.2
2	13.8	13.8	14.2
3	14.3	14.3	14.7
4	1.1	1.1	1.2
5	5.2	5.2	5.3
6	0.8	0.8	0.9
7	0.9	0.9	0.9
8	0.6	0.6	0.6
9	---	2.7	2.9
10	1.4	1.4	1.5
11	0	0	0
12	3.9	3.9	3.9
13	3.9	3.9	3.9
14	3.9	3.9	3.9
15	---	0.1	0.1
16	13.8	13.8	14.2
IC6001			
1	5.2	5.2	5.3
2	0	0	0
3	---	---	5.0
4	---	---	0.2
5	4.7	4.7	4.9
6	0	0	0
7	0	0	0
8	4.7	4.7	4.8
9	0.1	0.1	0.2
10	5.1	5.1	5.1
11	4.9	4.9	5.0
12	0	0	0
13	4.9	4.9	4.9
14	5.0	5.0	5.1
15	4.8	3.4	4.9
16	5.0	5.0	5.1
17	5.2	4.9	5.2
18	5.0	5.1	5.1
19	5.1	5.1	5.1
20	5.1	5.1	5.1
21	0	0	2.6
22	---	---	0
23	1.5	2.6	5.1
24	0	0	0
25	---	---	---
26	0	0	0
27	0	2.6	2.6
28	5.1	0	0
29	3.8	3.8	1.5
30	0	0	0
31	0	0	0
32	0	0	0
33	---	2.3	2.6
34	2.4	2.5	0
35	2.4	2.4	2.5
36	5.1	5.1	5.2
37	---	---	2.7

MODE / PIN NO.	REC	PLAY	STOP
38	---	---	2.6
39	0	0	0
40	4.7	4.7	4.7
41	4.7	4.8	4.7
42	0	0	0
43	4.7	4.7	4.7
44	4.7	4.7	4.7
45	4.7	4.7	4.8
46	4.7	4.7	4.8
47	1.9	2.0	2.0
48	0	0	0
49	1.9	1.9	2.0
50	2.7	2.7	2.7
51	5.2	5.2	5.3
52	2.5	2.6	2.7
53	2.5	2.6	2.7
54	0	0	0
55	0	0	0
56	5.1	5.1	5.2
57	4.6	4.6	4.7
58	0	0	0.1
59	0	0	0
60	5.1	5.1	5.1
61	0.3	0.2	0.2
62	5.1	0	5.2
63	5.1	5.1	5.1
64	0	0	0
65	1.1	0.9	1.2
66	0	0	0
67	0.2	2.6	0
68	---	---	2.6
69	2.5	2.5	2.6
70	2.5	-0.1	2.6
71	0	-0.1	0
72	2.5	---	2.6
73	5.1	5.1	5.2
74	1.9	1.6	2.5
75	1.5	1.6	2.6
76	2.5	2.5	2.6
77	1.8	0.2	2.6
78	3.4	2.8	3.4
79	4.6	3.7	4.7
80	---	---	4.7
81	4.9	4.9	4.9
82	0	0	0.2
83	0	0	0.1
84	0	0	0
85	1.7	0.1	2.2
86	1.7	0	2.6
87	5.2	5.2	5.3
88	5.2	5.2	5.3
89	5.2	5.2	5.3
90	5.2	5.2	5.3
91	5.0	5.0	5.1
92	0	0	0

MODE / PIN NO.	REC	PLAY	STOP
93	5.0	5.0	5.1
94	5.0	5.0	5.1
95	0	0	5.1
96	5.2	4.9	0
97	0	0	5.1
98	1.5	2.6	0
99	5.1	5.1	5.1
100	0.2	0	0.4
IC6002			
1	1.1	1.1	1.2
2	0	0	0
3	0	0	0
4	---	---	0.1
IC6003			
1	---	2.3	2.4
2	1.1	1.1	1.2
3	0	0	0
4	---	---	0.2
IC6005			
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	5.2	5.2	5.2
6	5.1	5.1	5.1
7	0	0	0
8	5.2	5.2	5.3
Q6001			
E	0	0	0
C	---	---	5.1
B	0	0	0
Q6002			
E	11.2	12.0	12.1
C	11.8	0	0
B	12.0	12.1	12.1
Q6003			
E	5.1	0	0
C	11.2	12.0	12.1
B	4.5	0	0
Q6005			
E	4.3	4.3	4.4
C	5.1	5.1	5.2
B	5.2	5.2	5.3
Q6006			
E	0.7	0.7	0.8
C	0.1	0.1	0.1
B	0	0	0
Q6007			
E	0.1	0.1	0.1
C	5.1	5.1	5.2
B	5.1	5.1	5.2

MODE / PIN NO.	REC	PLAY	STOP
Q6009			
E	0	0	0
C	5.1	5.1	5.2
Q6010			
E	0	0	0
C	5.0	5.1	4.8
TP6001	---	---	5.2
TP6002	---	---	0.2
TP6003	3.4	2.9	2.9
TP6004	5.0	5.2	5.1
TP6005	5.0	5.1	5.1
TP6007	0	0	0
TP6008	0	0	0
TP6009	5.2	5.3	5.3
TP6010	5.3	5.3	5.3
TP6011	5.2	5.2	5.2
TP6014	0	0	0
TP6016	3.5	3.5	3.5
TP6017	0	0	5.3
TP6018	5.2	5.3	0
TP6019	0	0	5.3
TP6201	2.3	0.2	0
TP6202	2.4	2.5	4.1
TP6203	2.5	2.6	2.6
TP6204	1.1	1.2	5.3
TP6205	2.6	2.6	0.1
TP6206	2.9	2.6	2.6
TP6207	2.5	2.6	2.6
TP6208	2.5	2.6	4.1
TP6209	2.3	2.5	2.6
TP6210	2.3	0.8	2.3

CAPSTAN STATOR C.B.A.

MODE / PIN NO.	REC	PLAY	STOP
P2502			
1	13.6	13.8	14.3
2	5.2	5.2	5.2
3	5.3	5.3	5.3
4	2.2	2.4	2.6
5	0	0	0
6	2.6	2.6	2.6
7	0	0	0
8	0.5	0.6	0.5
9	2.6	2.6	2.7
10	0.1	0.1	2.6
11	0	0	0
12	0	0	0
P2503			
1	2.5	4.2	4.2
2	3.3	4.3	4.3

Hi-Fi AUDIO/VIDEO HEAD AMP C.B.A.

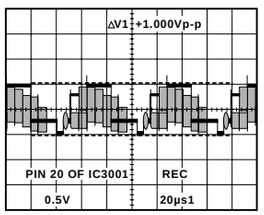
MODE / PIN NO.	REC	PLAY
IC3501		
1	2.6	2.6
2	0.2	4.2
3	0	1.4
4	0	0.7
5	0	0
6	0	0.7
7	0	1.4
8	0	0
9	0	0
10	0	2.1
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	5.9	0
17	5.9	0.1
18	6.3	0
19	---	---
20	---	---
21	---	---
22	---	---
23	---	---
24	---	---
25	11.8	0
26	5.0	5.2
27	0	0
28	0	0
29	0	0
30	2.7	0
31	5.1	0
32	5.0	0.3
33	0	0
34	0.2	0.4
35	11.9	12.0
36	0.3	4.9
TP3501	0	0

OPERATION C.B.A.

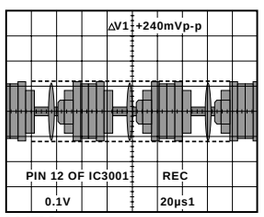
MODE / PIN NO.	REC	PLAY
IC6401		
1	0	0
2	0	0
3	5.1	5.1
4	---	---
5	---	---
6	0	0
7	0	0
8	0	0
9	5.1	5.1
10	2.6	2.6
11	2.6	2.6
12	0	0
13	5.1	5.1
14	5.1	5.1
15	5.1	5.1
16	5.1	5.1
17	5.1	5.1
18	5.1	5.1
19	5.1	5.1
20	5.1	5.1
21	5.1	5.1
22	5.1	5.1
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
IC6403		
1	5.1	5.1
2	5.1	5.1
3	0	0
Q6401		
E	0	0
C	0	0
B	11.0	11.0

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

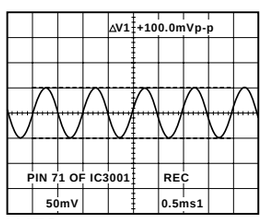
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



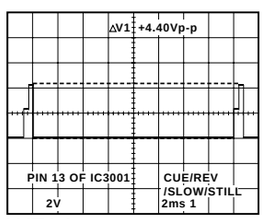
WF1



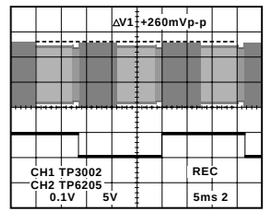
WF6



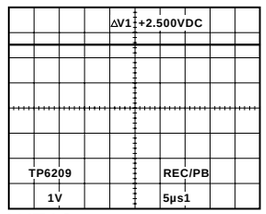
WF9



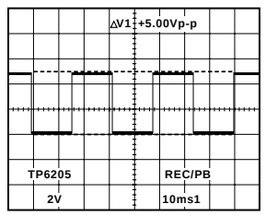
WF14



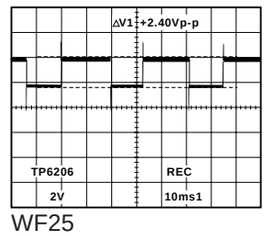
CH1 WF18
CH2 WF22



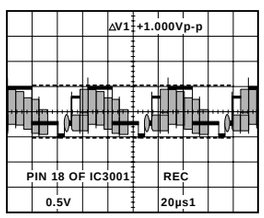
WF19



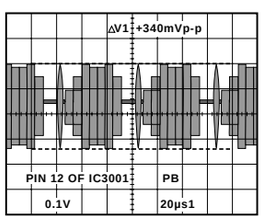
WF22



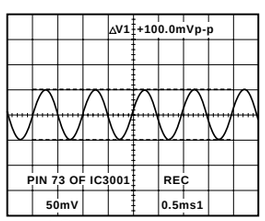
WF25



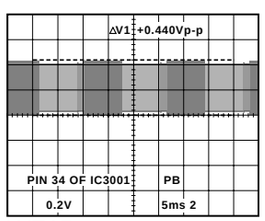
WF2



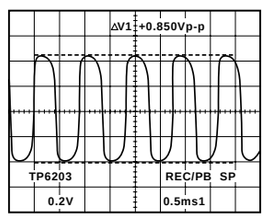
WF6



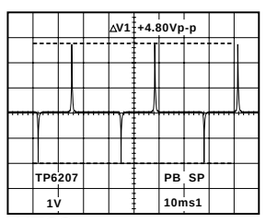
WF10



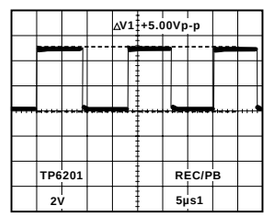
WF15



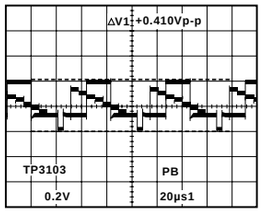
WF20



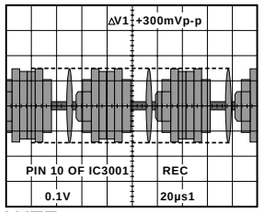
WF23



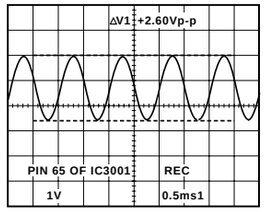
WF26



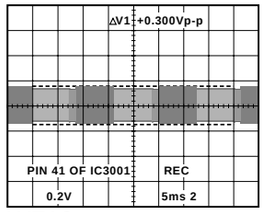
WF3



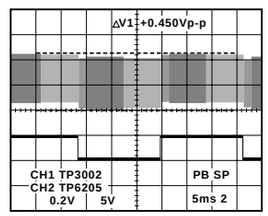
WF7



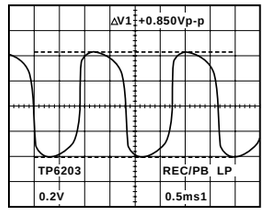
WF11



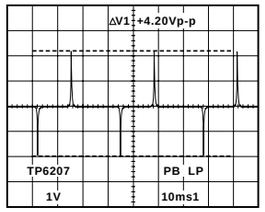
WF16



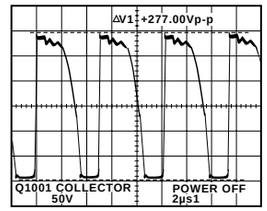
CH1 WF18
CH2 WF22



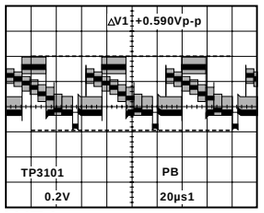
WF20



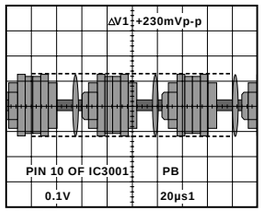
WF23



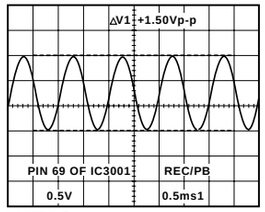
WF27



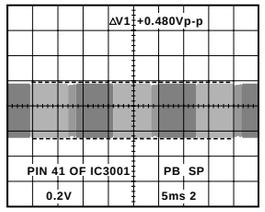
WF4



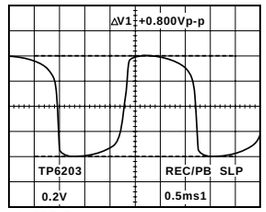
WF7



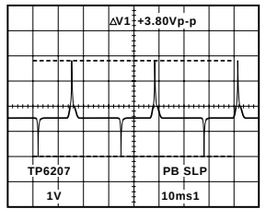
WF12



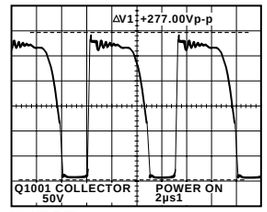
WF16



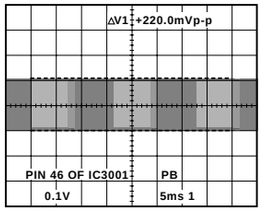
WF20



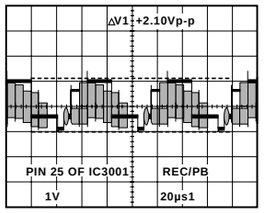
WF23



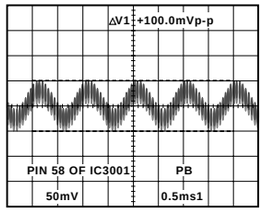
WF27



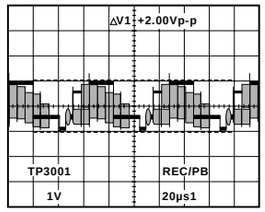
WF5



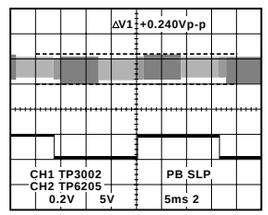
WF8



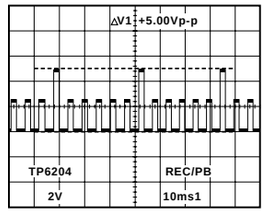
WF13



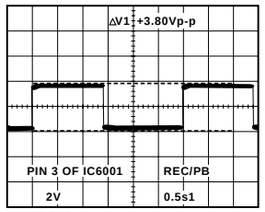
WF17



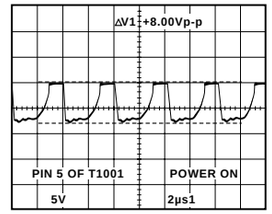
CH1 WF18
CH2 WF22



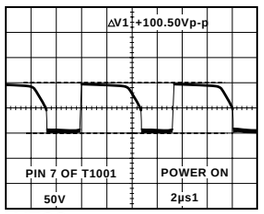
WF21



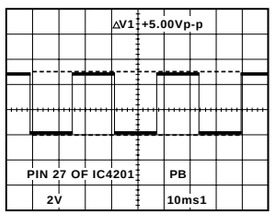
WF24



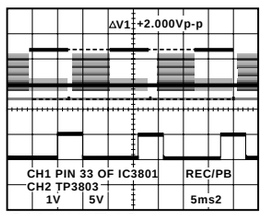
WF28



WF29

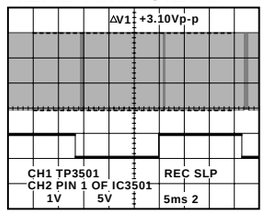


WF34

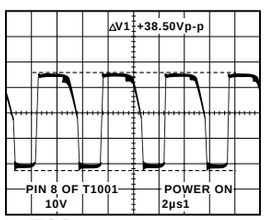


CH1 WF40
CH2 WF41

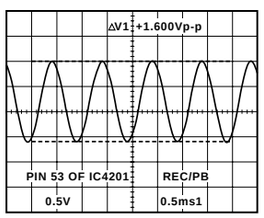
Hi-Fi AUDIO / VIDEO HEAD AMP C.B.A.



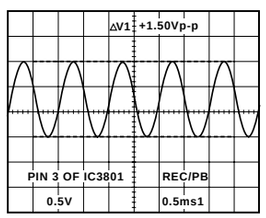
CH1 WF49
CH2 WF50



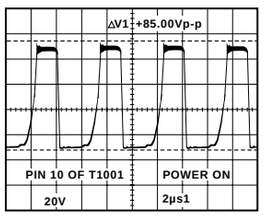
WF30



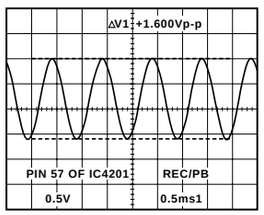
WF35



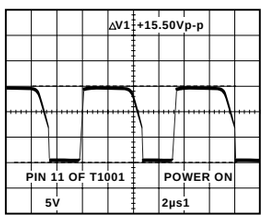
WF42



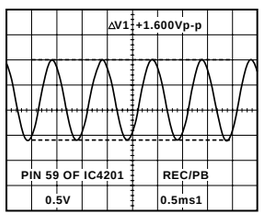
WF31



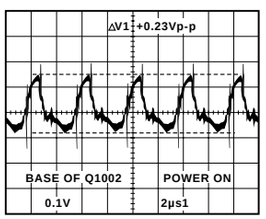
WF36



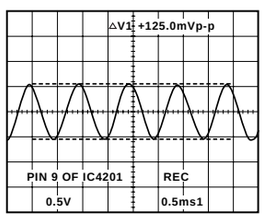
WF32



WF37



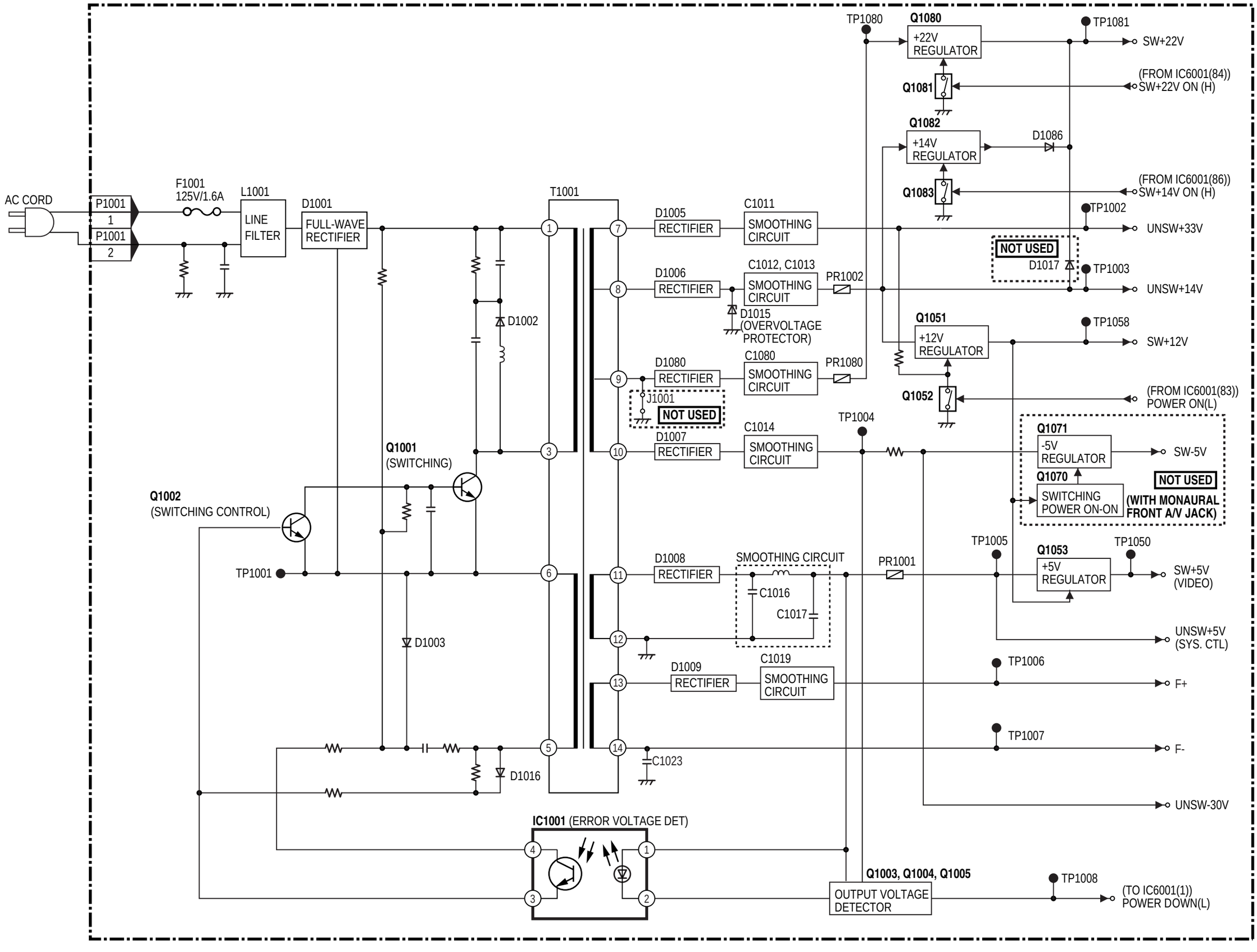
WF33



WF38

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

MAIN C.B.A.


AC CORD
P1001
1
P1001
2
F1001
125V/1.6A
L1001
LINE FILTER
D1001
FULL-WAVE RECTIFIER
T1001
D1002
Q1001
(SWITCHING)
Q1002
(SWITCHING CONTROL)
TP1001
D1003
D1016
C1023
IC1001 (ERROR VOLTAGE DET)
D1005
RECTIFIER
C1011
SMOOTHING CIRCUIT
D1006
RECTIFIER
C1012, C1013
SMOOTHING CIRCUIT
PR1002
D1015
(OVERVOLTAGE PROTECTOR)
D1080
RECTIFIER
C1080
SMOOTHING CIRCUIT
PR1080
J1001
NOT USED
D1007
RECTIFIER
C1014
SMOOTHING CIRCUIT
D1008
RECTIFIER
SMOOTHING CIRCUIT
C1016
C1017
PR1001
D1009
RECTIFIER
C1019
SMOOTHING CIRCUIT
TP1080
Q1080
+22V REGULATOR
TP1081
SW+22V
Q1081
(FROM IC6001(84))
SW+22V ON (H)
Q1082
+14V REGULATOR
D1086
Q1083
(FROM IC6001(86))
SW+14V ON (H)
TP1002
UNSW+33V
NOT USED
D1017
TP1003
UNSW+14V
Q1051
+12V REGULATOR
TP1058
SW+12V
Q1052
(FROM IC6001(83))
POWER ON(L)
TP1004
Q1071
-5V REGULATOR
SW-5V
Q1070
SWITCHING POWER ON-ON
NOT USED
(WITH MONAURAL FRONT A/V JACK)
TP1005
Q1053
+5V REGULATOR
TP1050
SW+5V
(VIDEO)
UNSW+5V
(SYS. CTL)
TP1006
F+
TP1007
F-
UNSW-30V
Q1003, Q1004, Q1005
OUTPUT VOLTAGE DETECTOR
TP1008
(TO IC6001(1))
POWER DOWN(L)

MAIN C.B.A.

REC VIDEO SIGNAL

PB VIDEO SIGNAL

HEAD AMP C.B.A. (FOR 4HEAD MODEL)

UHF/VHF TUNER/TV DEMODULATOR UNIT

RF

17 VIDEO VIDEO 2

J6003

(WITH 2 HEAD) NOT USED (FROM IC6001(23)) HEAD SW PULSE

(WITH 4 HEAD) (FROM IC6001(98)) ROTARY SW

IC3101

CCD 1H DELAY

5 4

(TO IC6001(78)) ENVELOPE VOLTAGE

IC3001 (VIDEO PROCESS)

29 27 49 40

AT ENVELOPE DETECT

VIDEO IN 1

20 TUNER

18

16 LINE 1

LINE 2

REC

PB

REC/PB LUMINANCE SIGNAL PROCESS

REC REC PB PB-Y

PB REC-Y

46 45 TP3002

Y/C MIX

41

REC REC-C

REC/PB CHROMINANCE SIGNAL PROCESS

PB PB-C

34

P3551 1

OPERATION C.B.A.

VIDEO IN 2

P6302 14 P6320 14

REC PB

Y/C MIX ART V/H MIX

I²C CONTROL

13 25 10 12 1 3 7 8

(FROM IC6001(24)) V-LOCK PULSE

1 8 IC3101

CCD 1H DELAY

(TO/FROM IC6001(17)) I²C SERIAL DATA

(FROM IC6001(18)) I²C SERIAL CLOCK

IC3201

1 CCD 1H DELAY 8

Q3202 AMP

(WITH ADVANCE)

IC6001

Q3875

(TO IC3801(33)) VIDEO

BUFFER

49 OSD CHARACTER MIX 47

Q3001 BUFFER

Q3201 PHASE COMPENSATOR

R3205 CNR GAIN

R3204 CNR PHASE

TP3001

(WITH CNR)

VIDEO OUT

IC3501 (HEAD AMP)

TP3501

SP 18

LP/SLP 16

P3501 1 30 REC PB

4 6 13 11

L R L R

SP LP/SLP

P3503 6 P3503 5 P3503 4 P3503 1 P3503 2 P3503 3

VIDEO SP L HEAD

VIDEO SP R HEAD

VIDEO LP/SLP L HEAD

VIDEO LP/SLP R HEAD

31 32 1

(FROM IC6001(23)) HEAD SW PULSE

(FROM IC6001(99)) HEAD AMP SW

(FROM IC6001(62)) PB(L)

HEAD AMP C.B.A. (FOR 2HEAD MODEL) NOT USED

IC3501 (HEAD AMP)

TP3501

18

P3501 1 30 REC PB

6 4

L R

P3503 1 P3503 2 P3503 3

VIDEO L HEAD

VIDEO R HEAD

31 1

(FROM IC6001(23)) HEAD SW PULSE

(FROM IC6001(62)) PB(L)

REC AUDIO SIGNAL
PB AUDIO SIGNAL

MAIN C.B.A.

UHF/VHF TUNER/TV
DEMODULATOR UNIT
RF
14 AUDIO
AUDIO 1

(WITHOUT Hi-Fi AUDIO)
C4018
R4018
NOT USED

Q4001
+5V
Q4002
Q4003

IC3001 (AUDIO PROCESS)
56
(WITHOUT
FRONT A/V JACK)
71
TUNER
LINE
AGC DET
REC-OFF
AUDIO
IN 1
J4002
73
PB
AGC
REC
AMP
REC-ON
65
MUTE
57
58
PB
AMP
60
LINE
AMP
AUDIO
MUTE(H)
I²C
CONTROL
69
75
7
8

(WITH MONAURAL
FRONT A/V JACK)
NOT USED

IC4151
(INPUT SELECT)
13 LINE1
14
12 LINE2
11
(FROM IC6001(19))
INPUT SELECT 2

OPERATION C.B.A.
AUDIO
IN 2
P6302 19
P6320 19

(WITH Hi-Fi AUDIO)
(FROM IC4201(61))
NORMAL AUDIO
(TO IC4201(62))
NORMAL AUDIO

(TO/FROM IC6001(17))
I²C SERIAL DATA
(FROM IC6001(18))
I²C SERIAL CLOCK
(FROM IC6001(59))
AUDIO MUTE(H)

(TO IC3801(3))
AUDIO
(WITH ADVANCE)

J4003
Q4006
Q4004
DRIVE

AUDIO
OUT
J4001
R4013
(WITHOUT Hi-Fi AUDIO) NOT USED

BIAS OSC
T4101, Q4101

HEAD AMP C.B.A.
P6202 3
P6202 1
P3551 3
P3551 4
P2601 3
P2601 1
P3501 3
P3501 4
P4091 2
P4091 1
P4091 4
P4091 3

AUDIO CONTROL
HEAD UNIT
P4092 2
P4092 1
P4092 4
P4092 3
AUDIO
HEAD
AUDIO
ERASE
HEAD

FULL ERASE HEAD UNIT
P4001 2
P4001 1
PIN 2
PIN 1
FULL
ERASE HEAD

REC AUDIO SIGNAL
PB AUDIO SIGNAL

MAIN C.B.A.

UHF/VHF TUNER/TV DEMODULATOR UNIT
RF
SIF
AUDIO
15
1

NOT USED
(FROM IC3001(79))
3.58MHz
J4204
Q4201
BUFFER
(FROM IC6001(26))
3.58MHz
J4203

(TO IC6001(82))
MTS MODE
(TO IC6001(60))
AUDIO DEFEAT(H)
(TO IC6001(29))
Hi-Fi PB(H)

(WITH SPATIALIZER)
NOT USED
TO/FROM SPATIALIZER
PIN 1
PIN 3
PIN 5
PIN 7

NOT USED
C4921
FL4901
4.5MHz BPF
3
1

IC4201 (Hi-Fi AUDIO PROCESS)
56
45
28
48

MTS/SAP SIGNAL PROCESS
MATRIX
MUTE CONTROL
ENV DETECTOR
AGC DET
AGC AMP
REC AMP

TUNER
LINE1
LINE2
(R-CH)
(L-CH)
R
L+R
L
MUTE
Hi-Fi
MIX
NORMAL

R-CH Hi-Fi AUDIO SIGNAL PROCESS
L-CH Hi-Fi AUDIO SIGNAL PROCESS

9
10
61
53
59
57
14
15

TP4204
TP4203
TP4202
TP4201
AUDIO IN1 R-CH
AUDIO IN1 L-CH
AUDIO OUT R-CH
AUDIO OUT L-CH

(WITHOUT SPATIALIZER)
J4202
J4201

HEAD AMP C.B.A.
24
21
22
29
30
27

P4451 2
P4451 3
P4451 4
P4401 2
P4401 3
P4401 4
P3503 7
P3503 8
P3503 9

Hi-Fi AUDIO L HEAD
Hi-Fi AUDIO R HEAD

OPERATION C.B.A.
AUDIO IN 2 R-CH
AUDIO IN 2 L-CH
P6302 16 — P6320 16
P6302 19 — P6320 19

AUDIO MUTE(H)
36
62
42
43
I²C CONTROL

(TO IC3001(73))
NORMAL AUDIO
(FROM IC6001(59))
AUDIO MUTE(H)
Q4004 DRIVE

(TO/FROM IC6001(17))
I²C SERIAL DATA
(FROM IC6001(18))
I²C SERIAL CLOCK
(FROM IC3001(69))
NORMAL AUDIO
(FROM IC6001(27))
Hi-Fi HEAD SW PULSE

Q4005
Q4006
Q4007

CAPSTAN STATOR C.B.A.

MAIN C.B.A.

IC2501 (LOADING MOTOR DRIVE)

LOADING MOTOR DRIVE

15 LOADING MOTOR FORWARD(H)

16 LOADING MOTOR REVERSE(H)

19

21

P2502 7

P2502 5

P2503 2

P2503 1

P6201 7

P6201 5

LOADING MOTOR

M

IC6001 (SYSTEM CONTROL MICROCONTROLLER)

VDD 36 +5V

TP6019

MODE SW POSITION C 95

TP6018

MODE SW POSITION B 96

TP6017

MODE SW POSITION A 97

SW6002 (MODE SELECT SWITCH)

PIN NO. OF IC6001 / MODE	A (97)	B (96)	C (95)
FF/REW	H	H	L
BRAKE	L	H	H
PLAY/CUE/SLOW/STILL	L	H	L
REVIEW	H	L	L
STANDBY/STOP	H	L	H
CASSETTE DOWN	L	L	H
EJECT	L	L	L

4 3 2 1

IR DATA 5

U6301 INFRARED RECEIVER UNIT

Q6001,Q6005, Q6006,Q6007

+5V RESET 25 RESET

(FROM POWER SUPPLY CIRCUIT) POWER DOWN (L)

1 POWER DOWN(L)

TP6001

+5V

3 TAKEUP REEL PULSE

4 SUPPLY REEL PULSE

79 TAKEUP PHOTO TR

80 SUPPLY PHOTO TR

SW+12V

SW+5V

D6001 SENSOR LED

Q6010 (TAKEUP PHOTO TR)

Q6009 (SUPPLY PHOTO TR)

IC6002 (TAKEUP REEL SENSOR)

IC6003 (SUPPLY REEL SENSOR)

X6001 (14.3MHz)

OSC 38 OSC 1

OSC 37 OSC 2

SW6001 SAFETY TAB SW

30 SAFETY TAB BROKEN(H)

(TO IC3501(25)) DELAY REC+12V

SW+12V

Q6002

Q6003

28 VIDEO DELAY REC(H)

IC6005 (MEMORY)

5 I²C SERIAL DATA

6 I²C SERIAL CLOCK

I²C SERIAL DATA 17

I²C SERIAL CLOCK 18

(TO/FROM IC3001(8)) I²C SERIAL DATA

(TO IC3001(7)) I²C SERIAL CLOCK

(TO/FROM IC4201(43)) I²C SERIAL DATA

(TO IC4201(42)) I²C SERIAL CLOCK

(WITH Hi-Fi AUDIO)

AUDIO CONTROL HEAD UNIT

HEAD AMP C.B.A.

MAIN C.B.A.

CONTROL HEAD

P4092 5 / P4092 6

P4091 5 / P4091 6

P2601 5 / P2601 2

P6202 5 / P6202 2

TP6206

IC6001 (SERVO MICROCONTROLLER)

75 REC CTL AMP

74 PB-ON

72 NEGATIVE PB CTL SLICER

1/2 Vcc

+5V

69

70

TP6207

76 POSITIVE PB CTL SLICER

21 CAP REV(H)/ STOP(M)/ FWD(L)

SELECT

TP6203

67 SCHMIT

COUNT DOWN

68 AMP

TP6209

INTEGRATION

33

TP6201

PG SELECT

PWM

CAPSTAN SPEED COMPENSATOR

MIX

CYLINDER/ CAPSTAN PHASE COMPENSATOR

MIX

PWM

CYLINDER SPEED COMPENSATOR

REC CTL / TR MM GENERATOR

TP6205

23 (TO IC3501(1)) HEAD SW PULSE

ENVELOPE DETECTOR

78 TP6003 (FROM IC3001(40)) ENVELOPE VOLTAGE

V-LOCK PULSE GENERATOR

24 (TO IC3001(13)) V-LOCK PULSE

CAPSTAN STATOR C.B.A.

CAPSTAN COIL

IC2501 (CAPSTAN MOTOR DRIVE)

Q2501 HALL TRANSIS-TOR 4 3

Q2502 HALL TRANSIS-TOR 6 5

Q2503 HALL TRANSIS-TOR 2 1

POSITION SIGNAL PROCESS

CAPSTAN MOTOR DRIVE 25 24 22

DIFFER-ENTIAL AMP 10 7 12

P2502 4 / P2502 10 / P2502 8

P6201 4 / P6201 10 / P6201 8

IC2505

MR HEAD 2 3 GND

P2502 9

P6201 9

CYLINDER UNIT

HEAD AMP C.B.A.

IC2601 (CYLINDER MOTOR DRIVE)

HALL IC

CYLINDER MOTOR

P3502 4 / P3502 6 / P3502 3 / P3502 2 / P3502 1

P2601 9 / P2601 7 / P2601 10 / P2601 11 / P2601 12

P6202 9 / P6202 7 / P6202 10 / P6202 11 / P6202 12

7 6 1 2 16

PG/FG PULSE GENERATOR

CYLINDER MOTOR DRIVE

4 9

INTEGRATION

TP6202

65 PG/ FG SEPARATOR

HEAD SW SIGNAL GENERATOR

22 FORCED ACCELERATION

34

20 CAP TORQUE LIMIT

SLOW /STILL CONTROL

(WITH 4 HEAD)

HEAD AMP CONTROL

ROTARY SIGNAL GENERATOR

98 (TO IC3001(49)) ROTARY SW

HEAD AMP SELECT SIGNAL GENERATOR

99 (TO IC3501(32)) HEAD AMP SW

100 (FROM IC3501(33)) ENVELOPE DET

MAIN C.B.A.

OUT / IN	SCAN 1 PIN 93	SCAN 2 PIN 94
DATA 8 PIN 40	——	REW /REV
DATA 9 PIN 41	——	PLAY
DATA 10 PIN 43	——	STOP /EJECT
DATA 11 PIN 44	POWER	CH DOWN
DATA 12 PIN 45	CH UP	TV/VCR
DATA 13 PIN 46	REC /TIME	FF /CUE

IN

OUT

IC6001
(SYSTEM CONTROL MICROCONTROLLER)

- 40 KEY DATA 8
- 41 KEY DATA 9
- 43 KEY DATA 10
- 44 KEY DATA 11
- 45 KEY DATA 12
- 46 KEY DATA 13
- 93 SCAN 1/CATV DATA
- 94 SCAN 2/CATV CS(L)
- 55 CATV SCK
- IC6301 CS (L) 57
- SERIAL DATA 1 13
- SERIAL CLOCK 1 11

IC6303 (INDICATOR PANEL CONTROL)

- 22 IC6301 CS (L)
- 24 SERIAL DATA 1
- 23 SERIAL CLOCK 1
- GRID 1G 4
- GRID 7G 10
- GRID 8G 12
- GRID 11G 15
- SEGMENT 0 31
- SEGMENT 13 44
- SEGMENT 14 1
- X IN 20
- X OUT 19

GRID

SEGMENT

DISPLAY TUBE

FIP

X6301

4MHz

P6302 6 — P6320 6
P6302 7 — P6320 7
P6302 8 — P6320 8

OPERATION C.B.A.

IC6401 (CATV CONTROL)

- CATV CS (L) 15
- CATV DATA 16
- CATV SCK 3
- IR CODE 8
- VDD 9
- RESET 13
- X IN 11
- X OUT 10

D6402 INFRARED LED

Q6401

D6403 INFRARED LED

D6401 INFRARED LED

+14V

+5V

IC6403
RESET

X6401 (4MHz)
OSC

(WITH CABLE BOX CONTROL)